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ALTERNATIVE FUTURES IN U.S. NUCLEAR STRATEGY

by

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Alternative Futures In U.S. Nuclear Strategy

by

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ABSTRACT

This thesis examines the future of United States nuclear strategy from the alternative futures/scenarios methodological approach. It begins by tracing the evolution of U.S. declaratory strategic policy from the end of World War II to the present. Specifically, it focuses on those particular environmental threats, constraints, and resources that were fundamental to the development of a nuclear strategy for each time period. The same kind of analysis is used to examine four alternative future security environments. Specific nuclear strategies are then developed for each alternative world scenario.

The U.S. Navy's Maritime Strategy, especially the nuclear component, is presented as an example of the strategy development process. Finally, the process of strategic planning in the military and long-range planning in general are discussed.

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I. INTRODUCTION

The atomic explosions at the end of World War II signaled a new era in modern warfare. Already, the twentieth century had been the most destructive in history in terms of loss of life and destruction as a direct result of wars. Yet the atomic bombs dropped on Hiroshima and Nagasaki by the United States demonstrated an even greater element for wartime catastrophe. Since that time, however, the major preoccupation for military and political leaders has been searching for ways to prevent the further use of these destructive weapons. The irony of this effort, however, has been the continued development of nuclear weapons and strategies in parallel with the evolution of measures to prevent their use.

While efforts to ban the use of nuclear weapons and even measures to abolish their existence are to be applauded, the simple fact is their creation cannot be undone. The technology exists and will continue to exist in the future. Thus, again, while measures must be adopted and adapted to ensure the use of nuclear weapons will not occur, the possession of such weapons requires some thinking as to their utility. For the military strategic planner, this means considering changes to long-range nuclear strategies that will adapt to various future environments. Moreover, such strategies must include measures for the actual employment of nuclear weapons in the

event that deterrence should fail. A nation's very survival in the future may depend on its ability to develop nuclear strategies that are designed to handle a number of contingencies if deterrence fails. Clearly, no one likes to hear that, but such displacement will not make the possibility go away. This requires even more the ability to plan for such an occurrence and develop credible strategies to ensure the nation's, even the world's survival. Dennis M. Drew and Donald M. Snow echo this justification for planning a credible nuclear strategy for the United States:

Nuclear war remains a special case for the strategist. It is the only contingency for which strategy aims largely, if not wholly, at the avoidance of employing military forces in pursuit of national ends. It is also arguably the least likely form of warfare in which the United States might engage, but its potential is also the most consequential. Since national destruction remains a possible result of engaging in nuclear hostilities, the security dilemma is indeed a real factor that hangs like a Damoclean sword over this entire area of strategic concern.[1]

For the past four decades U.S. defense policy has revolved around the concept of deterrence. Moreover, nuclear weapons have been instrumental in the formulation and implementation of defense planning and policy. The absence of global war since WW II appears to have supported deterrence as the keynote to a successful U.S. defense policy. Still, what has encouraged peace in recent times does not guarantee the same in a changing present and uncertain future environment.

The postwar bipolar structure is truly giving way to a multipolar world with a multitude of new players every day.

Current trends in economics, demographics, and technology demonstrate this shift in the international arena. Moreover, these trends signal the need for reevaluation of the military and defense plans necessary to achieve national objectives in support of the national interests. In particular, the nation's nuclear strategy must be addressed within the context of the changing security environment. This allows the development of new policies and strategies as U.S. foreign and domestic interests change.

Presumably, there is a distinct set of factors which consistently must be addressed in the formulation of U.S. nuclear strategy/policy. These factors should not only guide strategic nuclear doctrine but influence the development of the strategic forces to implement that doctrine. Moreover, these same factors should be able to be applied by long-range planners to forecast or recommend future strategies and force structures to fit the changed environment.

In a broad sense, there are generally three categories which directly affect U.S. military strategy formulation and force structure development. They are the military, political, and technical aspects of the national security planning process. Obviously, within each of the three broad categories there are more specific factors which directly and indirectly affect weapons development, procurement/acquisition, and strategy/doctrine articulation. The purpose of this study, however, is to consider only those changes in the future

security environment that affect the development of U.S. nuclear strategy. As a result, the future world environment is analyzed from the perspective of threats, constraints, and resources.

Obviously, there are other factors to be considered in the development of U.S. nuclear strategy than the environment. Indeed, the underlying concept for all national security strategy formulation and military development is the "national interest." In other words, the development of any national security strategy generally begins with the articulation of a fundamental set of values and interests. Next in the process is stating broad goals or objectives that support the national interests. Finally, the specific strategy is formulated by considering the national interests and objectives and assessing nation's particular current strengths and weaknesses[2]. The assumption in this study, however, is that the national interests and objectives remain the same in the long-range futures that are analyzed. Therefore, considerations for long-range national nuclear strategies are based strictly on changes in the future world environment.

Once again, this study is developed explicitly from the perspective of a military strategic planner oriented toward nuclear weapons strategy. Thus, the first chapter examines the purpose, process, and methodologies essential to strategic planning in the military. In addition to the discussing current problems and the various methodologies employed in

long-range planning, trend analysis and forecasting in general will be discussed briefly in this section. Finally, the alternative futures/scenarios methodology will be presented as a valuable tool for the military strategic planner and the one used exclusively in this study.

The next chapter examines the evolution of U.S. nuclear strategy from the end of World War II through the 1970s. This examination is not intended as simply a rehash of well-known historical events. Instead, it is an examination of the development of U.S. nuclear strategy from the perspective of threats, constraints, and resources. This analysis is concluded in the next section of the study through the examination of the most recent U.S. nuclear strategies using the same three factors. In addition, this chapter focuses on one armed services' role within the national nuclear strategy by examining the U.S. Navy's Maritime Strategy. Moreover, again, the development of the Maritime Strategy, especially the nuclear component, is examined from the same perspective of threats, constraints, and resources.

Alternative future environments will be discussed in the next chapter by presenting Charles W. Taylor's *Alternative World Scenarios For Strategic Planning*[3]. A number of studies have considered alternative strategic futures and the implications for U.S. military planning[4]. Moreover, many of these studies have similar conclusions about the future security environment. Taylor's work was chosen, however, more to

highlight the alternative futures/scenarios methodology than to stress his results. Nevertheless, this book has been critiqued by scholars in the field who concluded that Taylor's methodology and results were sound[5]. This at least lends some credibility to this study's use of Taylor's four future environments for developing long-range U.S. nuclear strategies based on changing world conditions. In addition, there is enough variance between his four alternative futures to force strategic planners to seriously think through different nuclear strategies for each scenario.

Perhaps the most important section of this study is the last chapter which postulates a U.S. nuclear strategy for each of Taylor's four future world scenarios. While the strategies are intended to be broad statements of future U.S. nuclear policy, they are based on the specific threats, constraints, and resources that characterize each scenario. Therefore, this chapter demonstrates how the strategic planner can analyze the long-range environment using the alternative futures/scenarios methodology. More importantly, it summarizes this study's thesis that analyzing the future environment from the perspective of threats, constraints, and resources helps planners develop long-range U.S. nuclear strategies. Clearly, as "the role of strategy stands necessarily at the center of any discussion of national security planning,"[6] planning alternative U.S. nuclear strategies for various future world scenarios is essential.

II. STRATEGIC PLANNING IN THE MILITARY

A. INTRODUCTION

The key to the development of a successful national policy is planning. Specifically, strategic planning is fundamental to any policymaking process, especially one designed for implementation over the long term. This includes prediction and forecasts, analysis of current and projected trends, and periodic reevaluation of national objectives. As military strength remains essential for U.S. security, the defense planning process continues to be important in the development of fundamental strategies to achieve national objectives. This process involves the identification of national values and security interests, threat assessments, defense policy and military strategy formulation, and determining the most effective force structure to execute the strategy[7].

Correctly thinking through an organization's strategy or strategic approach for long-term planning is not unique to the military. In fact, it is in the corporate business world that strategic planning is most often discussed. What makes strategic planning in the military unique, however, is its subject matter--warfare. As retired U.S. Army Lieutenant General John H. Cushman writes:

Its subject is warfare--the employment of force and military assets to achieve specified objectives. . .

their focus is more the operational employment of military forces and the planning related thereto.[8]

The planning process becomes complicated when several conceptual levels (e.g. strategy, operations, and tactics) of warfare are considered. Moreover, warfare must be examined in one of several domains, such as "strategic (or intercontinental) warfare," "maritime warfare," and "theater warfare." [9] Finally, military planning encompasses the logistics and administration of forces across a broad spectrum of warfare, from minor engagements to major campaigns.

But strategic planning in the military is, or should be, more than an operational plan for the employment of forces in wartime, though that is fundamental to its mission. It should also include social, economic, and demographic factors which might impact on the military's mission (or ability to carry out its defined mission), including its peacetime role. Mostly, however, literature on military strategic planning is filled with a description of the tools, principles, and forces necessary to wage battles [10]. The importance of the war-fighting ability of the military has not diminished. Again, this includes warfare across a broad spectrum from low intensity conflict to general nuclear war. Nevertheless, under contemporary conditions, military strategic long-range planning should include a forecast of all the factors that might affect the military's ability to support the national interests. This is particularly true in the development of nuclear

strategy given the possible consequences of an inadequate strategy should deterrence fail.

That effective long-term strategic planning is essential to the development of policies and strategies that fit the national objectives in support of the national interests appears obvious enough. What is not so clear, however, is how to conduct effective strategic planning--i.e. what methodologies should be used?

In choosing a forecasting method, several desirable properties are useful as criteria for selection[11]. The methodology must be comprehensive but simple to use and understand; it must be plausible and explicit, allowing for reproducibility; finally, the methodology should incorporate existing theory yet be sensitive to nuances. Other factors such as the skills and resources needed and the time and effort required are important as well. Moreover, the methodological approach will vary with the kind of problem to be examined and the expertise and experience of the forecaster[12]. Still, these criteria are useful as guidelines in the selection of the best method for the given problem.

In general, forecasting techniques can be roughly divided into structuring techniques and qualitative/judgmental methods[13]. The former employs systems analysis and networking theory to define the elements of and examine relationships between systems. This methodology includes analysis of specific system parameters through the examination of performance

measures, costs, limits, capabilities, key events, and alternatives. The one shortcoming with these techniques is that upon first inspection anything considered irrelevant to a given system is automatically excluded. Thus, an element that could be critical to the development of a system may not be included.

The second methodological grouping employed in forecasting, as its name implies, is more qualitative than the former. These methods offer predictions about the future by individual and group analysts or "experts." This use of expert judgment, common to many forecasting approaches is especially valuable as a forecasting technique when considering new untested areas. Among the various approaches within this methodology are the simple poll or panel of experts, the Delphi technique, and scenario methods. The first two approaches search for consensus within forecasting groups. Scenarios, on the other hand, emphasize uncertainty and forecast plausible alternative futures[14]. This last approach will be discussed in much greater detail later.

The discussion of strategic planning and forecasting thus far has only briefly touched on the various methodological techniques employed toward that end. To be sure, there are a variety of methods that can be used by the forecaster in the approach to any specific problem. Among these are: extrapolation, regressions, leading indicators, complex models, curve fitting, forecasting by analogy, and multiple-source forecast-

ing[15]. Without going into any detail on any of these techniques, suffice it to say that the variety of approaches used by forecasters, often in combination, are dependent on the subject matter and problem to be explored.

B. TREND ANALYSIS

Closely related to the forecasting technique of extrapolation but deserving of separate discussion is trend analysis. Mostly quantitative and utilizing statistical techniques, trend analysis is used to forecast into the future values of a given variable from the analysis of past (and present) relationships among two or more sets of data. While there are many different techniques, trend analysis often "serves as both a basis for and a complement to many other, more elaborate forecasting methods." [16] This is particularly true with long-range planning and forecasting in the military.

As with most forecasting techniques, several assumptions, characteristics, and qualifications underlie all trend analysis methods. First, and perhaps most important, is the assumption that what characterized the relationships between variables in the past will be the same in the future. Equally important and similar is the assumption in the continuity of all the factors and conditions upon which a particular trend is based. Other critical elements include the time span for the analysis and the availability of reliable data over that same period. Finally, the statistical techniques used to identify the trends in variables and the relationships between

the same must be deemed valid[17]. These assumptions could more accurately be described as limitations or disadvantages in using a particular methodology. Nevertheless, trend analysis can be very useful to other forecasting approaches designed for the long-term by extrapolating current trends to the hypothesized future. This is especially true with the alternative futures/scenarios methodology applied to military strategic planning.

C. SCENARIOS

From the above discussion it is apparent that many techniques and methodologies may be employed in strategic planning and forecasting. How to decide which one is best depends on several factors including the subject matter, the expertise and choice of the analysts, and the spatial and temporal frame of reference. This study will restrict itself to the examination of the scenarios and developmental constructs approach[18] mentioned earlier. Moreover, this specific methodology will be applied to the future national security concerns for the U.S. with specific recommendations for nuclear strategies in alternative future scenarios. It is clear that military forecasters are increasingly adopting these kind of methodologies for long-range planning. In fact, according to Earl D. Cooper and Steven M. Shaker, "the U.S. Air Force, Army, and Navy have all undertaken futures-studies projects in

an effort both to prevent the outbreak of war and to better protect the nation should war occur." [19]

Scenarios are essentially hypothesized futures based on given sets of conditions in specific areas of interest. Both qualitative and quantitative, scenarios serve well as forecasting tools by providing a framework for analyzing specific future issues and developments. The Defense Intelligence Agency's Methodology Catalog provides a more general description of the use of scenarios as a forecasting methodology:

Scenarios serve well in a number of forecasting situations. . . . Among the sort of problems that scenarios address are the success, failure, or unanticipated effects of a particular decision or strategy Scenarios can explicitly reflect different and often competing points of view about the future held by different experts in an area. Finally, scenarios work well in spanning and encompassing significant alternatives when the future is highly uncertain. The approach generally seeks to clarify genuinely uncertain situations rather than to predict where it is not possible to do so. In effect, scenario analysts develop alternative forecasts based on explicit, significantly different, but nevertheless plausible sets of assumptions and logics about the future. [20]

The analysts and the specific area of interest determine explicitly how the scenarios approach is used as a forecasting technique. Moreover, the point of focus in the strategic planning and forecasting processes establishes the complexity and general makeup of the scenarios themselves. Thus, from one to several scenarios may be used to describe the postulated future for a given problem. While single scenario approaches are valid, however, they are generally avoided in forecasting due to their limited expectations of the hypothe-

sized future. Also referred to as the "surprise-free" approach, the single scenario is more useful for identifying and analyzing the development of a consensus view of the future based on the continuation of current trends[21].

More useful to the strategic planner is the multiple scenario or alternative futures approach. The fact that several alternative scenarios are developed for the hypothesized future allows for a greater probability of encompassing any uncertainty inherent in the planning process. Moreover, the set of alternative future scenarios in combination should describe the "most plausible" future for the analyst. Again, this approach is particularly valuable to the military strategic planner "as a basis for evaluating alternative strategic and tactical situations in military environments." [22]

The use of this methodological approach by the military and defense organization actually originated in the late 1940s and early 1950s when Department of Defense planners used scenarios for contingency planning[23]. Still, this early use of scenarios was limited and only considered narrowly defined topics. Later, in the 1960s, futurists like Herman Kahn applied the alternative futures/scenarios to the field of national security[24]. This early work even included proposals for alternative nuclear strategies for the U.S. in the future[25]. Thus, the foundation for today's military strate-

gic planning using the alternative futures and scenarios methodology originated in the early postwar years.

D. SUMMARY

Once again, military strategic planning is a long-range process that includes analyses of military and non-military factors likely to affect the future role of defense to the national security of the United States. Because alternative futures are essentially designed for long-range planning models, they are an appropriate tool for the military strategic planner in designing plausible strategies for the future[26]. For that reason, the alternative futures and scenarios methodology is used exclusively in this study to examine the future of U.S. nuclear strategy.

III. THE EVOLUTION AND DEVELOPMENT OF U.S. NUCLEAR STRATEGY

A. INTRODUCTION

Before proceeding with this study of U.S. nuclear strategy, the concept "strategy" must be clarified. Often what is termed strategy can just as easily be referred to as doctrine or policy. Moreover, nuclear strategy can be divided into distinct levels known as declaratory strategy, development and deployment strategy, and employment strategy[27]. Perhaps the best definition of a nuclear strategy, at least for this study, is that given by Aaron L. Friedberg: ". . . a set of objectives, however crudely defined, and an accompanying plan containing detailed targeting and employment requirements. . . ."[28]

Using that definition, therefore, this study will examine the evolution of U.S. nuclear strategy from the immediate postwar years through the 1970s. This evolution will be divided into phases, which not coincidentally will correspond to the various Presidential administrations that emerged during this period. Although it will include doctrine, policy, and strategy, this examination will more accurately represent the evolution of U.S. declaratory strategic policy. More importantly, however, it will focus specifically on the three categories of threats, constraints, and resources, assumed fundamental to the development of any nuclear strategy. These

broad categories and the components of each will be highlighted in the summary to each stage and the overall summary at the end of this section.

B. The Evolution Of U.S. Declaratory Strategic Policy¹

1. Phase I: 1945-1949

a. Introduction

As with the entire section of this study , much has been written about the immediate postwar time period. Specifically, as related to nuclear strategy, the postwar years in the Truman administration were simply a continuation of the strategic bombing lessons learned in World War II. This was a period characterized by very few nuclear weapons, although the United States had a monopoly on the ones that did exist. Also well known is the fact that out of the Second World War emerged two superpowers. For the United States as one of those powers, it quickly became evident that the other superpower (the Soviet Union) was the major adversary (or threat).

As with most periods subsequent to major wars, the United States began to demobilize militarily in 1945. Still, in an effort to check the probable Soviet advance, the U.S. adopted a strategy of containment as articulated by George Kennan (NSC-20)[29]. At the same time, deterrence

1. A good summary of the evolution of U.S. declaratory strategic policy, from which the title for this section was obtained, is found in Ref. [60].

became associated with the U.S. strategy to contain the USSR by threatening nuclear retaliation should the Soviets engage in imperialist aggression.

While a nuclear monopoly was maintained, however, the U.S. essentially had no nuclear strategy for most of this period[30]. Moreover, as William H. Baugh notes: ". . . the United States did little to acquire either a significant stock of nuclear weapons or any effective means of delivering them to targets over intercontinental distances."[31] Worse still was the fact that thoughts on the actual use of nuclear weapons varied little from the traditional ideas for the utility of weapons in wartime. That is, nuclear weapons were considered only a more destructive weapon to be exploited as any other traditional wartime munition[32]. Finally, the secrecy which characterized the development of the atomic bomb carried over into this period. As a result, outside of a small group of scientists, very little was known about nuclear weapons, even among the nation's leaders. Thus, what nuclear doctrine did exist at that time was at best primitive. Dr. Baugh echoes this sentiment:

Strategic doctrine of the period seems hardly to have developed beyond expectations that nuclear bombs could be used against cities with military potential or production complexes, as had been done in Japan, and that such a threat should pose a highly credible deterrent.[33]

b. Threats, Constraints, And Resources

Other works provide a more scholarly and better detailed description of the evolution and development of U.S. nuclear strategy during the immediate postwar time frame[34]. Nevertheless, from the brief examination of that period presented here one can already infer the elements that were and are fundamental to the development of such a strategy. Moreover, those elements that most influenced nuclear thinking at that time are easily grouped into the three broad categories of threats, resources, and constraints. First, in the area of threats, without question the Soviet Union became the primary threat to U.S. interests and objectives. While it will be argued later in this study that perhaps the focus of this threat should be shifted, the USSR provided the early motivation for the United States' development of a nuclear strategy. Clearly, without the perception of a significant threat there is little justification for the continued development of new weapons systems, let alone a strategy to accompany them.

Second, resources, or in this case the lack of resources, specifically influenced the ability to develop a credible nuclear strategy for the United States. Already alluded to is the fact that "actual production capability at the end of the war was only a few nuclear weapons per month, and no intercontinental bombers yet existed"[35] Moreover, even by 1948 only 32 modified B-29s capable of carrying nuclear bombs existed, and by July of that year there

were only some 50 nuclear bombs in stock[36]. Finally, as for human resources, personnel trained for nuclear weapons were quite scarce; by early 1947 the Strategic Air Command had 20 trained air crews and only six weapons assembly specialists[37].

In the final category of constraints, several elements combine to make this grouping perhaps most significant to the development, or, again, lack of development, of a U.S. nuclear strategy. Militarily, the nation was constrained due to the massive demobilization at the end of the war. In addition and related to that was the domestic constraint of public indifference to any sort of military buildup or development. After a long and costly (although arguably much less so for the U.S.) war, the last thing anyone wanted to think about was preparation for a future confrontation. This domestic constraint (later broadly labeled "public opinion") clearly hindered the development of nuclear employment and deployment strategy as well as the weapons to advance such a policy. On the other hand, economic constraints allowed for nuclear weapons to be justified as more cost-effective than their conventional counterparts.²

c. Summary

In summary, then, the time frame 1945 to 1949 produced little thinking in the U.S. on the development of a

2. For a thorough treatment of the resources and constraints of this period, see Ref. [34], pp. 1-71.

strategy to accompany the small but unequalled stock of nuclear weapons. Any thinking on the utility of nuclear weapons was simply based on the strategic bombing carried out in World War II. Moreover, nuclear weapons were not considered to be any different in purpose or utility than conventional munitions, only more destructive. Still, this period produced the foundation for those elements considered fundamental to the development of a nuclear strategy to this day. This includes the USSR as the primary threat, the avoidance of nuclear war as a prime objective (later articulated as the strategy of deterrence), and the resources and constraints essential to weapons development and strategy formulation.

2. Phase II: 1950-1960

a. Introduction

The transition from the first to the second phase in the evolution of U.S. declaratory strategic policy was a rather slow one. That is, during the early stages of this second phase little had changed in the way of thinking about nuclear strategy. As Jerome H. Kahan notes:

. . . even after the Soviet Union's first atomic test in 1949 and the completion one year later of a National Security Council study (NSC-68) that contained cogent analyses of defense requirements in a nuclear era, U.S. doctrine continued to emphasize preatomic concepts of strategic bombing and air superiority, defense of the homeland, and victory in a war of attrition involving conventional as well as atomic forces.[38]

Thus, during the late 1940s and early 1950s planners considered (and rightfully so) the U.S. and its allies immune to

nuclear retaliation. In addition, they thought America's nuclear capability served only as a counterweight to the USSR's conventional military threat to Western Europe[39]. Even when the USSR began to acquire a small atomic arsenal between 1949 and 1952, however, "the implications of atomic weapons were still not fully translated into operational U.S. military policies or programs." [40]

Still, during this phase there were changes in the way the U.S. viewed the utility of nuclear weapons. Moreover, changes in the threat (or threat perception), the presence of constraints (mostly domestic), and the availability of resources all influenced the U.S.'s new thinking on nuclear strategy. These fundamental changes in combination with several key international events helped bring about the articulation of America's first declaratory strategic policy.

b. Threats

Under the category of threats, the Soviet Union remained the primary threat to U.S. security. Moreover, as the nature of this threat changed during this period, so did U.S. thoughts on nuclear strategy. Again, before the USSR possessed a nuclear capability, the U.S. thought little of its atomic arsenal in terms of specific strategy. This all changed (though not immediately) in 1949, however, when the Soviets detonated their first atomic weapon and became a member of the nuclear club. Following this detonation, the Soviets immediately began to build an atomic arsenal. Never-

theless, by the time President Truman left office at the end of 1952, the Soviets "had not yet tested a thermonuclear device nor flown a long-range jet bomber." [41] In fact, the "Soviet atomic capability in 1952 was estimated at only 50 bombs and 800 TU-4 bombers." [42]

The time frame of 1953 to 1959 was known as the "revolution in military affairs" in the Soviet Union [43]. This was essentially the Soviet recognition of the "atomic fact" or, more specifically, recognition of the utility of nuclear weapons. Moreover, it was the acknowledgment by the Soviets of an entire new weapons system integrating the nuclear weapon, the missile, and the necessary guidance and control [44]. As a result, by the mid-1950s, the USSR had acquired a substantial nuclear capability, tested a thermonuclear device, and developed intercontinental delivery vehicles (bombers, then later ballistic missiles) [45]. Finally, events like the launching of the Sputnik satellite in 1957 boosted the USSR's credibility and forced the U.S. to reconsider its entire nuclear strategy.

c. Constraints

For this specific time period, the category of constraints can be broken down into two equally important domestic components--economic and public opinion. Both of these constraints influenced the development of nuclear strategy and resulted from an important international event for the United States--the Korean War. At the same time, the

new Eisenhower administration came into office convinced of the need to drastically reduce the defense budget,[46] mostly based on the effects of these two constraints. Jerome Kahan supports this assertion:

The President and his chief advisers were firmly convinced of the need to drastically lower the level of defense spending, since they viewed a balanced budget as essential to a strong U.S. economy, which in turn was judged vital for national security. Indeed, the Korean experience had led to widespread public sentiment not only to bring the troops home but also to reduce U.S. armed forces generally.[47]

In addition to the Korean war, other international events affected the development of U.S. nuclear strategy during this period and, when taken together, can be considered another element of the category of constraints. Specifically, events like the Communist victory in China and the growing Soviet domination in Eastern Europe presented new problems for U.S. national security. This caused not only a reevaluation of current national military strategies but helped bring about an increased reliance on the utility of nuclear weapons[48]. Clearly, changes in international alliance structures and security relationships fit into the broad category of threats to U.S. security. During this time period, however, these events also served to constrain U.S. military options and enhance the reliance on nuclear weapons, including the development of a nuclear strategy.

d. Resources

During this phase of the evolution and development of U.S. nuclear strategy, the category of resources deals

mostly with technological achievements in nuclear weapons and their delivery systems. Again, while the U.S. maintained a nuclear monopoly during the early stages of this period its atomic arsenal was very limited. In terms of delivery systems, for example, by the end of 1952 "the strategic forces of the United States still consisted of medium-range B-47 bombers based abroad and a small fleet of relatively ineffective propeller-driven B-36 aircraft." [49] Nevertheless, the early 1950s saw several major developments including the first thermonuclear weapon tested by the United States in November 1952 [50]. Much of the development in nuclear weapons and strategy that occurred later in this period can be attributed to "the Truman Administration's decisions to expand the U.S. atomic stockpile and build the hydrogen bomb." [51]

Examining President Truman's decisions to expand the U.S. nuclear weapons capability, David Alan Rosenberg writes:

The three approved increases in nuclear production may well have been the most substantive actions taken by the Truman Administration in the area of strategic nuclear policy during its last three years. By January 1953, a construction program was underway which would add eight plutonium production reactors and ten gaseous diffusion U-235 production plants to the five reactors and two gaseous diffusion plants operating in mid-1950. These plants and reactors were capable of supporting an enormous expansion of the nuclear weapons stockpile. [52]

As a result, the growth of the U.S. nuclear arsenal in the 1950s was massive. From an estimated 250 primitive atomic bombs in 1949 to approximately 1000 weapons in the summer of

1953, the U.S. arsenal grew to some 18,000 atomic and thermo-nuclear weapons by 1960[53]. Moreover, while the number of U.S. strategic nuclear delivery vehicles did not change greatly between 1954 and 1960, the total megatonnage increased over twentyfold[54].

e. Targeting

Thus far, the subject of targeting as related to the development of nuclear strategy has not been discussed in this study. Just as any strategy requires the means to achieve given objectives, however, targeting is fundamental to the credibility of any nuclear strategy. Yet, given the requirements to deliver a weapon to a specified target with some probability of causing damage, targeting can more accurately be categorized as a technological constraint. In the early years (1945-1950), given its extremely small nuclear arsenal, the U.S. had very limited means to deliver weapons to distant targets. At the same time, there were only a few target sets in the Soviet Union, outside of large urban and industrial areas, considered valid for the use of nuclear weapons. Aaron Friedberg describes this early focus on cities for nuclear targeting:

. . . shortages and an absence of extremely "time-urgent" targets (like Soviet nuclear weapons storage sites and delivery vehicles) combined with prevailing ideas about the utility of air power to shape early war plans. Cities were targeted because it was believed they could be found and hit from the air, because their destruction was thought the best way to weaken the Soviet military might, and because no other logical target set existed.[55]

Given the Soviet nuclear weapons developments and key international events mentioned earlier, this situation began to change in the 1950s.

As American planners became more concerned with the growing Soviet threat, existing target lists were expanded and subdivided into three categories: industrial facilities; "retardation" targets (e.g. transportation links); and counterforce targets[56]. Still, until the development of the first SIOP the counterforce target set remained very small, mostly due to operational and technical limitations[57]. Thus, in the SIOP "an 'optimum mix' of 'high priority military, industrial, and government control targets' was designated for destruction in a single, massive attack." [58]

f. Summary

While the decade of the 1950s is often considered the foundation of America's nuclear strategy, the origins can clearly be traced much earlier. The Truman Administration's decisions to buildup the military (through NSC-68) and further develop a nuclear capability, for example, were instrumental in the formulation of a U.S. nuclear strategy. Moreover, events like the Soviet Union's detonation of an atomic device in 1949 helped shape U.S. nuclear strategy throughout the decade and beyond[59]. Still, the 1950s saw the expansion of America's nuclear posture, both in weapons stockpile and capability and in strategic thought. The result was the first formal articulation of a U.S. nuclear strategy

on January 12, 1954 by Secretary of State John Foster Dulles known as "massive retaliation." [60]

In addition to the massive retaliation policy, other developments originated during this period that continue to influence U.S. nuclear strategy today. The first fits into the category of threats as its creation was essentially a reaction to the Soviet nuclear buildup and the perceived vulnerability of U.S. forces from that buildup. The result was the development of the nuclear Triad, a "multiforce strategic nuclear delivery capability consisting of bombers, ICBMs, and submarine-launched ballistic missiles (SLBMs)." [61]

The other major development had more to do with the actual employment of nuclear weapons in wartime. This was the creation of the first national nuclear war plan, known as SIOP-62 (Single Integrated Operational Plan) [62]. The SIOP was, again, more concerned with the actual targeting of nuclear weapons as discussed earlier.

Thus, the modern strategic nuclear era emerged during the decade of the 1950s as the U.S. and USSR acquired significant atomic arsenals including thermonuclear weapons and advanced intercontinental delivery vehicles. Jerome Kahan notes the results of these developments:

As a consequence of these technological developments, each of the major powers would gain a credible military capability to launch large-scale nuclear strikes from its own territory against the other side's homeland. The Eisenhower administration inherited the formidable task of responding to this unprecedented situation and designing practical security policies for the strategic nuclear age. [63]

And respond he did, for President Eisenhower entered office with the conviction that by exploiting the technology of nuclear weapons, the U.S. would be able to achieve its national security objectives and reduce defense spending at the same time[64]. The result was the New Look policy (NSC-162/2), which emphasized reduced defense spending and greater reliance on nuclear power[65].

The next phases in the evolution of the U.S. nuclear strategy will be discussed in much less detail than this one. Instead, the major developments in each stage of declaratory policy will be highlighted under the three main categories of threats, constraints, and resources.

3. Phase III: 1961-1980

a. Introduction

Recalling the definition of nuclear strategy and its close association with doctrine and/or policy, this phase could actually be divided into several stages depending on the source[66]. For this study, however, this phase will be divided into two parts to conform to the evolution of U.S. nuclear doctrine. The changes in U.S. declaratory strategic policy will be highlighted, however, as will the key targeting schemes. Once again, the fundamental changes for each stage will be categorized as threats, constraints, or resources on the assumption that these components are essential in the development of nuclear strategy.

b. 1961-1974: Assured Destruction And Damage Limitation

(1) Targeting. Even with an expanded list of "optimum mix" targets, the first SIOP was limited to an all-out, massive nuclear attack. Thus, the next step, as the Kennedy Administration saw it, was to revise the SIOP in an effort to introduce more flexibility to U.S. nuclear war plans[67]. The result was a new SIOP with greater emphasis on military installations and counterforce targets in general (i.e. war-making capabilities), but also options for withholding attacks on cities, even countries[68]. The now famous Ann Arbor speech of June 1962 by Secretary of Defense Robert S. McNamara sums up this emphasis on counterforce targeting:

. . . principal military objectives, in the event of a nuclear war stemming from a major attack on the Alliance, should be the destruction of the enemy's military forces, not his civilian population.[69]

This emphasis on targeting the enemy's war-making capabilities continued on throughout the decade of the 1960s and into the early 1970s. Thus, despite shifts in declaratory policy that indicated a priority of attacks on cities in a nuclear war, counterforce targeting remained the focus of U.S. nuclear war plans[70].

(2) Strategy. The alteration of U.S. war plans through changes in targeting requirements and a revision of the SIOP was made with a larger strategic purpose in mind. During the initial stages of this phase the strategy was essentially second strike counterforce. That is, in the event

of war the U.S. strategy would have been to destroy Soviet war-making capabilities (especially nuclear), while avoiding cities and minimizing civilian casualties. Residual American nuclear forces would in effect hold Soviet cities hostage and allow for politically acceptable war termination for the U.S. Thus, the emphasis was on maintaining survivable second-strike (or retaliatory) U.S. nuclear forces.[71]

Amid various criticisms³ from all sides,[72] McNamara's second-strike counterforce nuclear strategy lost much of its credibility. As a result, the U.S. nuclear strategy was transformed into one emphasizing two specific missions for the strategic forces--"assured-destruction" and "damage limitation." The essence of these two missions was articulated by McNamara in 1964:

. . . to deter deliberate nuclear attack upon the United States and its allies by maintaining a highly reliable ability to inflict an unacceptable degree of damage upon any single aggressor, or combination of aggressors, even after absorbing a surprise first strike. . . . to limit damage to our population and industrial capacity.[73]

For McNamara and many of his critics, the most important aspect of the assured-destruction strategy was that it provided planners with some index for sizing the strategic force structure[74]. Nevertheless, debates on the feasibility and credibility of U.S. nuclear strategy, espe-

3. These criticisms and especially the various constraints and perceived threats are discussed in greater detail in the summary to this section.

cially damage limitation, continued throughout this period, while the Soviet nuclear threat grew increasingly stronger[75]. Finally, in 1968 McNamara adopted a new revision of the assured-destruction strategy and announced the inevitability of a strategy of "mutual deterrence" or "mutual assured destruction." [76] This strategy was essentially "a form of 'parity' in which both sides maintained secure, second-strike, assured-destruction forces." [77] Even with these debates and apparent changes in strategy, however, there is little evidence that U.S. war plans varied between 1962 and 1974. Indeed, the second-strike counterforce strategy continued to guide U.S. war plans throughout this period[78].

As concerns declaratory strategic policy, this period produced several statements all centered around counterforce targeting. During the Kennedy years massive retaliation was abandoned and replaced by a policy of "assured destruction." Secretary McNamara revised this policy somewhat into one of "mutual assured destruction" during the Johnson Administration. Finally, President Nixon announced the policy of "strategic sufficiency" at the start of his tenure in the White House.[79]

c. 1974-1980: *Limited Nuclear Options And Counter-Recovery Targeting*

(1) Targeting. The evolution of U.S. nuclear strategy continued during the Ford Administration as changes, however subtle, were introduced to the planning process. These changes were mostly a continuation of the effort to

provide greater flexibility in the nuclear war-fighting plans. Specifically, targeting options were expanded so that portions of a target list could be executed without launching an all-out nuclear attack[80]. While providing expanded options, however, these changes did not significantly alter U.S. war plans as targeting continued to focus primarily on Soviet military (especially nuclear) installations[81].

(2) Strategy. The previous period was characterized by an increasing divergence between declaratory policy and actual employment plans as explained by Henry Rowen:

The primary purpose of the Assured Destruction capabilities doctrine was to provide a metric for deciding how much force was enough: it provided a basis for denying service and Congressional claims for more money for strategic forces. . . . However, it was never proposed by McNamara or his staff that nuclear weapons actually be used in this way.[82]

The point is that U.S. forces had the capability of completely destroying the relatively few targets (both urban-industrial and military) in the Soviet Union. Thus, small attack options aimed primarily at counterforce targets made sense. This began to change by the early 1970s, however, as the Soviet strategic nuclear arsenal was becoming larger and increasingly less vulnerable while U.S. nuclear forces leveled off[83]. Realizing these changes, the Nixon Administration conducted a series of studies to determine future U.S. military requirements, which led to another major change in American strategy[84].

The new strategy, announced by Secretary of Defense James Schlesinger in January 1974, was designed to specifically address changes in the strategic balance and the resulting consequences of those changes. In particular, the growth of Soviet nuclear capability in combination with constraints on American forces (budgetary and arms control) had essentially nullified existing U.S. war plans. The U.S. could no longer be assured of disarming the Soviet Union nor limiting damage to itself in an all-out nuclear war. In response to this imbalance, Schlesinger sought to once again introduce greater flexibility into existing war plans and provide for some control of nuclear escalation should deterrence fail. The resulting Schlesinger strategy introduced expanded but smaller attack options, known as limited nuclear options (LNOs), to increase the deterrent credibility of U.S. strategic forces and facilitate escalation control.[85]

In January 1977, new Secretary of Defense Donald Rumsfeld announced a further change in U.S. nuclear strategy. His "assured-retaliation" mission emphasized targeting Soviet military, political, and economic assets to impede the USSR's recovery from nuclear war[86]. Aaron Friedberg sums up the 1977 declared U.S. nuclear war strategy:

. . . in the event deterrence failed the primary U.S. objective was to control the process of escalation, bringing hostilities to an acceptable close at the lowest level of conflict possible, thereby limiting damage to the United States and its allies. If necessary, escalation control and thus damage limitation were to be achieved through the use of limited nuclear options. These options would serve both a military and a politi-

cal purpose. If escalation control failed, the United States would seek to destroy the USSR's recovery in the postwar period. Such attacks would also be designed to limit the Soviet Union's ability to retard U.S. recovery.[87]

According to Ben Plymale, the actual U.S. declaratory policy was announced in somewhat different terms than already presented. Specifically, Plymale notes, Schlesinger announced a policy of "Essential Equivalence" in 1974 based on four criteria: survivable second-strike reserves; symmetry in ability to threaten; balance in counterforce options; and perceived equality in offensive forces[88]. Moreover, Secretary of Defense Rumsfeld announced a U.S. policy of "Rough Equivalence" in 1976 based on similar criteria. According to Plymale again, however, Rumsfeld's policy was more a call to reverse the trends in the strategic balance, where the U.S.'s position was growing increasingly inferior[89].

The final changes in the U.S. nuclear strategy that occurred during this period were undertaken by the Carter Administration. This began in the summer of 1977 with a review of U.S. nuclear targeting policy and ended with Presidential Directive 59 announcing the "countervailing strategy" in 1980[90]. This strategy was only slightly modified by the Reagan Administration and heavily influences U.S. nuclear strategy today. For that reason, the countervailing strategy as well as PD-59 and its successor, NSDD-13, will be

examined in the next chapter's discussion of current U.S. nuclear strategy.

d. *Threats, Constraints, And Resources*

This phase in the evolution of U.S. nuclear strategy is characterized by various changes in doctrine, targeting schemes, and declaratory policy. The strategy of second-strike counterforce in combination with a declaratory policy of assured destruction and damage limitation marked the first stage of this period. This eventually gave way to the idea of limited nuclear options and counter-recovery targeting and the declaratory policies of strategic sufficiency, essential equivalence, and rough equivalence. While each of these strategies and policies can be associated with different Presidential Administrations, however, the bases for their development remained the same. Specifically, each nuclear strategy was formulated based on the perceived threat, the existing technology (resources), and various domestic and international constraints.

First, under the category of threats, the Soviet Union, or, more specifically, the Soviet nuclear capability, greatly influenced the formulation of U.S. nuclear strategy during this period. In fact, the Kennedy Administration's decision to abandon the massive retaliation strategy/policy for second strike counterforce was based largely on this perception of threat. In particular, an all-out nuclear attack could no longer be guaranteed to disable

the growing Soviet nuclear force nor would it encourage Soviet restraint in the event of war[91]. Moreover, concern for the increasing vulnerability of U.S. strategic forces from an expanding Soviet nuclear threat prompted Kennedy's decision to strengthen U.S. second-strike, long-range nuclear forces[92]. The same is true with McNamara's announcement of mutual assured destruction based on a "mutuality of interests" between the United States and the Soviet Union[93].

Whether these perceptions of the Soviet threat by the U.S. leadership were valid or not is irrelevant. More important is the effect they had on the formulation of U.S. nuclear strategy. To be sure, by the early 1970s the expansion of the Soviet nuclear capability had begun to change U.S. strategic thinking and led Schlesinger to consider the limited nuclear options approach. Quoting from *The Military Balance 1977-78*, Aaron Friedberg supports this threatening Soviet nuclear buildup:

In 1966 the Soviets began to deploy large numbers of ICBMs in hardened underground silos. Between 1966 and 1970 the size of their land-based missile force grew by 1,007--from 292 to 1,299 ICBM launchers. During this same period the Russian navy deployed twenty new ballistic missile submarines, increasing the number of submarine launched Ballistic Missiles (SLBMs) in its force from 107 to 304.[94]

Second, resources, mostly in the form of nuclear weapons technology, affected the development of U.S. nuclear strategy as well. Again, the Kennedy buildup of U.S. second-strike, long-range nuclear forces "helped to provide a technological basis for a strategy other than a massive nucle-

ar response."[95] Later, resources became more of a constraint (i.e. technological limitation) or obstacle to the implementation of Schlesinger's limited nuclear options strategy[96].

Finally, in the area of constraints, several factors combined to affect U.S. nuclear strategy formulation from the early 1960s through the 1970s. McNamara's shift from second-strike counterforce to assured destruction, for example, was heavily influenced by overwhelming Congressional criticisms as well as bureaucratic and budgetary constraints[97]. One specific Congressional criticism was the Department of Defense's promotion of active and civil defenses. Therefore, because these defenses could not be sold to Congress, the more indirect method of holding the adversary's cities hostage was adopted for the strategy of damage limitation[98]. Another example is the internal debate over strategic force size, which resulted in the various shifts in declaratory policy between 1963 and 1968 and led McNamara to adopt assured destruction[99]. Finally, international events such as the Vietnam War and the Strategic Arms Limitation Talks (SALT) also constrained the development of nuclear strategy during this period[100].

4. Conclusion

This chapter examined the evolution of U.S. declaratory strategic policy from the end of world war II through the decade of the 1970s. Moreover, it included the critical

shifts in doctrine which were fundamental to strategic policy formulation. The purpose of this section of the study has been to relate the changes in nuclear strategy to those factors which were essential for its development. More importantly, the aim has been to demonstrate that the creation of a nuclear strategy for any given scenario must start by considering elements within the broad categories of threats, constraints, and resources. The next step is to examine current U.S. nuclear strategies focusing on the same categories. In addition, the following section of this study will present one practical application or implementation of the U.S. nuclear strategy by examining the Navy's Maritime Strategy.

TABLE 1

EVOLUTION OF U.S. NUCLEAR STRATEGY SUMMARY

<u>Period</u>	<u>Strategy/Targeting</u>	<u>Threats</u>	<u>Constraints</u>	<u>Resources</u>
1945-49	None (Strategic Bombing)	USSR	Demobilized Militarily	US Nuclear Monopoly
	Targeting Of Cities	A-Bomb (1949)	Public Opinion Economic	Very Few Nuclear Weapons
1950-60	Massive Retaliation	USSR	Economic	NSC-68
	Deterrence	H-Bomb (1953)	Public Opinion	H-Bomb (1952)
	Industrial And Military Targets	Sputnik (1957)	Korean War	First SIOF
1961-74	Assured Destruction	USSR	Arms Control (ABM, SALT I)	First US MIRV
	Damage Limitation	ICBM, SLBM Buildup	Congress	Second-Strike Long-Range Nuclear Weapons Buildup
	MAD		US Internal Debates	
	Strategic Sufficiency			Poseidon Program
	Second Strike Counterforce Targeting		Vietnam War	
1974-80	Essential Equivalence	USSR	Arms Control (SALT II)	Trident Program
	Rough Equivalence			
	Economic Recovery Targeting			

IV. CURRENT U.S. STRATEGIES

A. INTRODUCTION

This section of the study will essentially continue the examination of the evolution of U.S. nuclear strategy by focusing on current developments. Specifically, those strategies (PD-59 and NSDD-13) developed during the time period 1980 to 1987 will be presented with implications for future U.S. nuclear strategy.⁴ Moreover, these particular strategies will be examined from, again, the perspective of threats, constraints, and resources. The intention here is to further demonstrate that developments in U.S. nuclear strategy can be explained by changes in the environment. This kind of examination is, therefore, useful to the military strategic planner who attempts to develop long-range strategies based, in part, on changes in the international security environment.

Finally, the Navy's Maritime Strategy will be examined in this section in an attempt to demonstrate the relevance of U.S. nuclear strategy. That is, the application or implementation of the U.S. nuclear strategy will be demonstrated by examining one specific service's role within the overall national nuclear strategy. In addition, the Maritime Strategy will be examined not only from a nuclear perspective but, once

4. All references to these official documents (i.e. PD-59, NSDD-13, etc.) are to the unclassified public descriptions, not the actual documents themselves.

again, within the categories of threats, constraints, and resources.

B. NUCLEAR STRATEGIES OF THE 1980s

1. PD-59: The Countervailing Strategy

a. Introduction

The events leading up to the signing of Presidential Directive No. 59 (PD-59) began shortly after President Carter had entered the White House. In reality, according to many noted scholars, the origins of the "countervailing strategy" can be traced much earlier as it was simply part of the evolution of U.S. nuclear strategy[101]. More important here, however, are the specific events that directly led to the development of PD-59.

In the summer of 1977, President Carter signed Presidential Directive 18 as part of his administration's overall review of U.S. defense policy. Specifically, "PD-18 directed the initiation of three studies concerning strategic matters--an ICBM Force Modernization Study, a study on the maintenance of a Secure Reserve Force and a Nuclear Targeting Policy Review." [102] What followed was an extensive examination of U.S. nuclear forces and capabilities, including targeting and war plans, as well as an analysis of similar Soviet nuclear capabilities and vulnerabilities. At the completion of this study and its review by the President in late 1978, the Department of Defense moved immediately toward a revision

of U.S. nuclear strategy. The end result was the articulation of the countervailing strategy which provided new guidance on nuclear war planning, targeting, force structure requirements and associated research and development programs. In short, it set forth new principles in nuclear strategy established during the administration's review of U.S. defense policy[103].

Briefly, PD-59, entitled "Nuclear Weapons Employment Policy," changed U.S. nuclear strategy in two basic ways. First, in targeting, emphasis shifted from economic recovery assets to primarily Soviet military and political targets. This was clearly a change in targeting focus from that mandated by the Schlesinger Doctrine (NSDM-242). Second, and perhaps more importantly, PD-59 formulated new plans and capabilities for the possibility of fighting a protracted nuclear conflict[104]. Again, the reasons for these changes in U.S. nuclear strategy are better understood by examining the development of PD-59 from the perspective of threats, constraints, and resources.

b. Threats, Constraints, And Resources

In the area of threats, "there was an extensive survey of Soviet nuclear doctrine and plans, including recent developments in their defensive programs." [105] Part of the PD-18 studies, this examination revealed the Soviet belief in and preparations for victory in nuclear war and the possibility that such a conflict might be protracted. According to

Leon Sloss and Marc Dean Millot, the "acknowledgement of these Soviet views at senior levels of the U.S. government had a profound influence on the strategy that ultimately emerged in PD-59." [106] There was little doubt in earlier U.S. strategic nuclear formulations that the Soviet Union was the primary threat to U.S. security. Yet, for the first time with PD-59, the development of U.S. nuclear strategy focused primarily on Soviet views of nuclear war and the "subjective" side of the deterrent equation [107].

In addition to the survey of Soviet doctrine and plans, however, it was the USSR's growing nuclear capability that led the Carter Administration to reassess the U.S. nuclear strategy. Scott Sagan notes some of these disturbing trends in the overall military balance:

Despite its adherence to the 1972 ABM Treaty restrictions on active ballistic missile defense, the Soviet Union was continuing vigorous strategic defensive programs in air defense against U.S. bombers and in civil defense leadership-sheltering capabilities. Soviet offensive improvements had also continued despite the SALT process. Most important, the huge Soviet MIRVed-ICBM force was rapidly achieving sufficient accuracy to threaten a large portion of the American Minuteman ICBMs. [108]

Similar concerns about the growing Soviet strategic force posture were raised in the 1980 Hearing On Presidential Directive 59 Before The U.S. Senate Committee On Foreign Relations:

The Soviet force developments that have occurred over the last 10 years or so, which include the deployment of MIRVed ICBM's of high accuracy and MIRVed SLBM's, the latter of which provide them with an enduring, survivable strategic offensive capability . . . have

brought Soviet strategic nuclear forces to a position of clear parity with the United States, and in one important area, ICBM vulnerability, have posed a severe challenge to the survivability of a part of the U.S. deterrent force.[109]

As alluded to earlier in this study, the categories of threats, constraints, and resources are closely linked in the development of U.S. nuclear strategy. The same holds true with the formulation of the countervailing strategy as articulated in PD-59. Specifically, the PD-18 studies revealed as many shortcomings in U.S. nuclear strategy and force structure as revelations about Soviet nuclear doctrine, war plans, and preparations. Moreover, many of the deficiencies that were revealed served as constraints in the development of the U.S. response. For example, after analyzing Soviet nuclear capabilities, U.S. strategists concluded that American C³I was clearly inadequate to meet wartime objectives, especially in a protracted conflict[110]. This is not the first time, nor will it be the last, that U.S. nuclear strategy was constrained by technological capabilities. In fact, according to William Baugh, "in both its technical and its political aspects, strategic doctrine is constrained by the available technology, and lies at the interface of technology and politics." [111] The point here though is that from an analysis of the threat, inadequacies in U.S. resources were revealed which served to constrain American nuclear strategy.

Other constraints were perhaps more subtle but important nevertheless in the development of the PD-59 nuclear

strategy. First, arms control agreements, especially the SALT II treaty, imposed constraints on the nuclear force structure which in turn restricted the flexibility of U.S. strategic plans[112]. Second, the development of the countervailing strategy was constrained by the criticisms of U.S. allies who demanded it be consistent with NATO's flexible response strategy[113]. Third, as always, short- and long-term budgetary concerns at least initially restricted the development of weapons systems/programs that were eventually called for in PD-59[114]. Finally, the development of PD-59 was constrained by the perceptions (and misperceptions) of the national leaders charged with determining the most credible and effective strategy for the U.S.[115].

Under the category of resources, again, the studies associated with PD-18 revealed important deficiencies in U.S. nuclear forces. Obviously, the growth in the Soviet nuclear arsenal and the increased hardness of its ICBM force[116] were largely responsible for these newly recognized inadequacies. Still, limitations in such areas as C³I and counterforce targeting hindered the flexibility of U.S. nuclear strategy[117]. As a result, actions were taken by the Carter Administration to initiate programs deemed essential to PD-59's requirements. Presidential Directives 53 (promoting enhanced telecommunications facilities) and 58 (advocating protection of national leadership and vital communications

equipment and improvements of early warning systems) were examples of such programs[118].

While PD-59 itself initiated subsequent improvements in nuclear forces and associated programs, however, prior U.S. technological developments (resources) actually helped formulate the countervailing strategy. For example, developments such as the sophisticated NS-20 on-board computer system[119] and the technologically advanced Mk12A reentry vehicle allowed for increased accuracies and true hard-target kill capabilities[120]. Moreover, according to Deborah Shapley, these developments resulted in "a technologically driven increase in the role allocated to precision counterforce strikes, closely associated with the rise of flexible targeting and countervailing doctrines"[121]

2. NSDD-13 And The Reagan Strategic Modernization Program

a. Introduction

During the first years of the Reagan Administration there was little evidence of any change in U.S. nuclear strategy. In fact, by most accounts, President Reagan was initially interested only in continuing the development of the previous Administration's countervailing strategy. According to Colin Gray, "the Reagan administration's issuance of the policy guidance document NSDD-13 in October 1981 was an endorsement and refinement of the ideas outlined in President Carter's PD-59 of July 1980"[122] This is hardly surprising considering the short amount of time elapsed between

the signing of these two Presidential Directives. As a result, both environments for this time period were characterized by essentially the same elements of threats, constraints, and resources. Still, Reagan's immediate focus, and later the motivation behind his strategic modernization program, was the acquisition of the nuclear capabilities to implement the countervailing strategy[123].

b. Threats, Constraints, And Resources

The Soviet Union obviously remained the primary threat to U.S. interests and, as such, provided the impetus for the development of both NSDD-13 and the strategic modernization program. Leon Sloss and Marc Dean Millot discuss the Soviet threat as one of the major factors that prompted the evolution in U.S. nuclear strategy culminating in NSDD-13. They write:

In addition to the intense pursuit of counterforce capabilities in their offensive forces, the expansion of Soviet air defense, their extensive passive defense programs, including civil defense, their continued large R & D efforts in ABM and the development of a Soviet anti-satellite capability bore convincing testimony that the Soviets were doing their best to prepare to defeat an enemy militarily and survive as a national entity in the event of nuclear war.[124]

Even shortly after the signing of NSDD-13, almost as if to justify the development of U.S. nuclear strategy, President Reagan remarked about the Soviet threat: "The truth of the matter is that on balance the Soviet Union does have a definite margin of superiority."[125]

Many of the same constraints that affected previous U.S. nuclear strategies also restricted development during this period. Among the most important were arms control agreements, budgetary restrictions, technological limitations, allied consensus, and public opinion. SALT II and the ABM treaty and negotiations for further nuclear weapons limitations (i.e. START and INF), for example, apparently restricted force structure development, and, thus, strategy implementation. Critics point out, however, that it was more the U.S. approach to arms control than the restrictions themselves that constrained the Reagan Administration's nuclear strategy. For example, Colin Gray writes:

The Reagan administration attempted in 1981 to pursue the strategically rational course of charting and funding its defense program before it committed itself to the arms control negotiating fray. This approach was a domestic and inter-Allied political failure of no small dimension or importance. In practice, notwithstanding the inherent merit of its approach, the administration forfeited the moral high ground of being seen to care about arms control--and ipso facto to many people, about peace. When the administration made dramatic and ambitious bids for public confidence by means of attention-seizing proposals for disarmament in intermediate-range nuclear forces (INF) and then in the Strategic Arms Reduction Talks (START), those bids looked as though they had been prompted by a concern to respond to public disquiet. Inevitably, some of the credit the administration might have expected to receive for such visible (and genuine) evidence of commitment to arms reduction was forfeited because of the widespread belief that the timing and the character of the proposals advanced were dictated more by a felt need to appease domestic and allied critics than by a genuine commitment to arms control.[126]

Moreover, writing about the ABM Treaty in 1981, Michael Nacht notes: "The Reagan Administration would suffer severe domes-

tic and international criticism if it terminated the treaty, except under the most compelling of circumstances." [127]

Another example illustrates the domestic constraints that have affected U.S. nuclear strategy throughout its evolution. This is the case of the MX missile originally announced by Carter, supported by Reagan, then delayed primarily due to domestic opposition. William Baugh sums up this example of the "political cycling of strategic weapons expenditures":

Originally announced by President Carter, partly as a domestic bargaining chip to gain Senate ratification of SALT II, MX deployment was strongly supported by President Reagan both before and after the 1980 election. Yet by the fall of 1981, faced with strong opposition to MX deployment in Utah and Nevada and with a desire to limit defense spending increases in hopes of balancing the federal budget by 1984, the Reagan administration was seriously considering proposals to reduce MX deployment to perhaps half the missiles and one fourth the number of shelters originally planned. [128]

Lastly, the issue of ethics and morality with regard to nuclear weapons, deterrence, the arms buildup, etc. became a highly publicized and much debated topic during the Reagan administration [129]. While the ethical issues raised against nuclear weapons were often supported by inconsistent arguments, [130] their validity was less important than the public support they could raise. Still, the morality and ethics of nuclear arms were often discussed by noted scholars and statesmen [131], particularly when advocating such options as "nuclear freeze" and "no first use." [132] Nor were debates on these and related issues confined to the United States as

similar discussions prevailed among U.S. allies in Europe during this time period[133]. Again, these issues merely highlighted the important role of public opinion and other domestic and international constraints in the development of U.S. nuclear strategy.

Finally, the influence of resources was intimately linked to the development of U.S. nuclear strategy during the Reagan administration. As many critics note,[134] however, it was often difficult to distinguish which came first, the weapons or the strategy. That criticism is certainly not new to the Defense Department, yet there is some validity to the statement that the development of strategy largely depends on the available resources. Moreover, as previously noted, there is clear evidence that NSDD-13 and the strategic modernization program were developed to establish the resources required by PD-59 and the countervailing strategy[135]. Thus, weapons acquisition and R & D programs were designed to improve all three legs of the nuclear triad and associated C³I systems as well as develop strategic defensive capabilities. Specifically, these programs included the development and modernization of the B-1 bomber, the MX ICBM, and the Trident II (D-5) SLBM[136]. Moreover, they included new emphasis on ballistic missile defense as noted during President Reagan's March 23, 1983 speech on the Strategic Defense Initiative (SDI)[137].

Resources are clearly fundamental to the development and implementation of U.S. nuclear strategy. Moreover, there is little question that resources were central to the development and credibility of NSDD-13 and the strategic modernization program. Still, resources or the process to establish more and better resources also often serves to constrain nuclear strategy development. As Senate Armed Services Committee Chairman Sam Nunn writes:

We lack the budgetary and manpower resources to do everything we now wish to do simultaneously. Two years ago, the Reagan administration announced a program to modernize most of our strategic nuclear forces; increase and modernize our conventional force structure; build a 600-ship navy; and improve readiness, sustainability, and military pay across the board. It is now obvious that the Reagan program cannot be fully implemented.[138]

Table 2 below summarizes these recent developments in U.S. nuclear strategy that were presented in this section of the study. In particular, it correlates the strategies with the specific threats, constraints, and resources that were critical to their development.

TABLE 2

CURRENT U.S. NUCLEAR STRATEGY SUMMARY

<u>Period</u>	<u>Strategy/Targeting</u>	<u>Threats</u>	<u>Constraints</u>	<u>Resources</u>
1977-81	PD-59 Countervailing	USSR	C ³ I	PD-53, PD-58
		MIRV	Arms Control (SALT II)	Buildup In C ³ I
		Strategic Defenses	Economic	NS-20, Mk-12A
			Allied Consensus	
			National Leadership Misperception	
1981-88	NSDD-13 Countervailing	USSR	Arms Control (START, INF)	Strategic Moderniza- tion Program
		Defenses Buildup (Air, Civil, ABM, ASAT)	Technological	
			Public Opinion	SDI
			Allied Consensus	
			Economic (Budgetary)	
			Ethics/ Morality	

C. THE MARITIME STRATEGY

1. Introduction

Again, the purpose of this section is to demonstrate the application of the overall national military strategy by focusing on the roles and missions of one particular armed service. It is here that actual employment and deployment of nuclear weapons can be discussed as part of an armed force's military strategy. Moreover, the examination of one services' military strategy from the perspective of threats, constraints, and resources will highlight its similarities to the national military strategy. The Navy was chosen as the service to investigate because of the author's familiarity with this branch of the U.S. armed forces. In addition, the Navy's Maritime Strategy offers for this study a specific and unique example for analyzing the development of strategy. Since this study is specifically about nuclear strategic planning, that area within the Maritime Strategy will be discussed with implications for the future.

The Maritime Strategy was formally articulated for the first time in the early 1980s.⁵ This is not to say that the navy lacked earlier strategies to support U.S. national interests, nor should it suggest that the "maritime strategy"

5. The first official version of The Maritime Strategy was published as a classified document within the Navy, Opnav 60 P-1-84, in May 1984. An unclassified version followed in January 1986 written by the CNO, Admiral James D. Watkins, and published as a special supplement to the U.S. Naval Institute Proceedings under the title "The Maritime Strategy."

was a novel concept[139]. More accurately, this official declaratory statement was the culmination of an historical evolution of U.S. naval thought and practice in peacetime and during war[140]. Yet, if anything, this codification of the U.S. Maritime Strategy increased the already frequent debates over the Navy's proper role in the national military strategy[141]. Nevertheless, the evolution and development of the Maritime Strategy is similar to that of the U.S. nuclear strategy presented earlier when viewed from the perspective of threats, constraints, and resources. Once again, this kind of analysis for developing long-range strategies is not new to the U.S. Navy[142].⁶

It is useful at this time to discuss briefly the definition and major objectives of the Maritime Strategy. In the words of Admiral James D. Watkins:

Maritime Strategy is derived from national military strategy and is an integral component of that strategy. The purpose of our strategy is deterrence; should deterrence fail our strategy relies on forward defense and allied cooperation to bring about war termination on terms favorable to ourselves and our allies.[143]

Since the Maritime Strategy is simply the maritime component of the National Military Strategy, it is useful to define the latter as well. Again quoting Admiral Watkins:

6. By analyzing current trends, the study in Ref. [142] sought to identify environmental factors which might impact on the Navy in the 1972-1985 time frame. The five environments considered were: international, sociological, corporate, technological, and military.

Our national military strategy is designed: to preserve this country's political identity, framework, and institutions; to protect the United States, including its foreign assets and allies; to foster the country's economic well-being; and to bolster an international order supportive of the vital interests of this country and its allies.[144]

Therefore, the maritime strategy is specifically designed to support the three elements upon which the national strategy is founded: deterrence, forward defense, and alliance solidarity. Moreover, it is a global strategy that supports the national interests in a wide range of contingencies from peacetime through general nuclear war. As a result, its components include peacetime presence, crisis response, warfighting, and war termination. The warfighting component is further subdivided into three phases: deterrence or the transition to war; seizing the initiative; and carrying the fight to the enemy[145]. The next section examines the development of the Maritime Strategy as a function of threats, constraints, and resources.

2. Threats, Constraints, Resources

John Hattendorf writes about the importance of threats to the evolution of thought that eventually became the Maritime Strategy:

Any serious thinking about strategy must necessarily deal with the effect that one's forces will have on an opponent. How an enemy will use his forces is a critical factor in any strategic evaluation. Thus, when determining how forces might be deployed for achieving broad future goals in a war, one must also assess the probability of how an enemy might act and react. One must examine everything that an enemy can do which may materially influence one's own course of action.[146]

Along those lines, there is little question that the Soviet Union was considered the only major threat to the U.S. Navy during the formulation of the Maritime Strategy. Captain T. M. Daly, USN writes about the importance of the Soviet Union to the development of the Maritime Strategy:

Because the Maritime Strategy is designed to deny the Soviet Union its preferred strategy, continued accurate knowledge of Moscow's strategy is central, especially during a period in which new major weapons systems--such as long range, land-attack cruise missiles--are coming on line. For this reason, any evidence of shifting priorities in Soviet naval strategy is central to maintaining the Maritime Strategy's focus and keeping it at the cutting edge.[147]

The growth of the Soviet Navy from the early 1960s[148] toward developing a blue-water fleet⁷ only increased the American perception of the USSR threat[149]. Specifically, Americans worried that the growing sea-denial capabilities of the Soviet Navy "could deprive the West of the free use of the sea, thereby creating political, economic, and military disaster."[150] As a result, during the early stages in the development of the Maritime Strategy, many in the U.S. "viewed the Soviet naval capability by mirror-imaging and refighting World War II."[151] This perception began to change in the late 1960s, however, as Soviet specialists in the U.S. began to emphasize the traditionally defensive nature

7. The definition of "blue-water fleet" is open to much interpretation. Some date this achievement by the Soviet Navy as early as the late 1960s, while others believe the Soviets still do not have a true blue water fleet today.

of Soviet naval strategy[152]. While this perception did not immediately prevail within the U.S. Navy, it was increasingly supported by the naval intelligence and Center for Naval Analyses communities. Moreover, the acceptance of these new views about the Soviet threat was central to the formulation of the U.S. Maritime Strategy in the late 1970s and early 1980s[153].

One last change in the way U.S. naval strategists viewed the Soviet threat was similar to that which occurred during the formulation of U.S. nuclear strategy in PD-59. In particular, beginning with Admiral Hayward's appointment as Chief of Naval Operations in June 1978, naval strategists began to study in depth the nature of the Soviet threat[154]. Admiral Watkins (Hayward's successor as CNO) continued this emphasis on better understanding of the Soviet threat in his effort to develop a formal statement of the Maritime Strategy. As one of the four key elements in his thoughts on the Maritime Strategy, Admiral Watkins mentioned "the effort to develop a better understanding of the Soviet thought processes and inherent strengths and weaknesses in order to counter and exploit them." [155]

The constraints in the development of the Maritime Strategy, while mostly domestic in nature, were also not completely novel. Moreover, some of the variations in specific constraints were directly related to national leadership changes. For example, during the 1960s and 1970s although the

official DoD statement on naval missions remained constant, the long-term force structure goals changed with each new Secretary of Defense[156]. This was especially true during the Carter years when his emphasis on the European central front conflicted with the Navy's global-oriented force structure designed for superiority over the Soviets[157].

In the 1970s most of the constraints involved debates on the Navy's budget. Unfortunately, many confused the debates on unit costs and program alternatives with strategy which led some critics to charge that unrealistic naval strategies were created to justify large building programs[158]. Moreover, this confusion led Admiral Hayward to state: "This is why academics and others say the Navy doesn't have a strategy." [159] Typical bureaucratic problems within the Navy Department also constrained the development of strategy during this period. Mostly, this involved the lack of exchange of ideas between different departments, thus, preventing commonly shared views from aiding the development of naval thinking and strategy formulation[160].

Finally, three memoranda written by the Vice Chief of Naval Operations, Admiral William N. Small, highlighted what he considered to be fundamental constraints to naval strategy development. Moreover, according to John Hattendorf, these memoranda led directly to the formulation and later publication of *The Maritime Strategy*[161]. First, Small observed a disconnect between strategy and ship/weapons con-

struction so that rather than strategy driving programs, the reverse was true[162]. Secondly, Small believed that the Navy's "worst-case mentality" in strategic thinking was detrimental to long-range planning and created a defensive rather than an offensive outlook[163]. Lastly, Small saw parochialism within the various naval service warfare specialties rather than integrated analyses in strategic planning. He believed this caused faulty analysis and created unrealistic threats, prevented affordability from affecting program recommendations, and resulted in inadequate combat systems[164]. Again, by focusing on critical constraints in naval strategic thinking, these memoranda led directly to the formulation of The Maritime Strategy.

The greatest effect the area of resources had on the development of the Maritime Strategy was through the establishment of organizations dedicated to naval strategic thinking. Among these were the Long Range Planning Group (Op-00X) instituted in January 1980, and the Center for Naval Warfare studies established at the Naval War College in April 1981. Also established at the Naval War College was a small group of the Navy's "best and brightest" officers devoted to naval strategic and tactical planning known as the CNO's Strategic Studies Group. In a broad sense, Admiral Hayward's purpose in creating these organizations was "to assist the Navy's leaders in thinking about strategy." [165] Specifically, "the mission of Op-00X was to assess resource limitations on

future naval capabilities and to analyze alternative strategies for achieving long-range goals" including "the interplay between strategy and tactics." [166] Hattendorf explains Admiral Hayward's purpose in creating these other institutions:

He wanted to create a core of future naval leaders who would be well-versed in the role of naval forces in national policy and strategy. He also wanted to re-establish the Naval War College as the pinnacle for education in naval strategic thinking. [167]

Admiral Hayward was also interested in overcoming the continual budget battle with Congress by focusing on increasing the overall readiness posture of the Navy and not worrying about force levels. Thus, "Hayward put his priority on spare parts, ammunition, pay, and benefits," concentrated on developing "a war-winning strategy," and emphasized "strategic issues for a global maritime power." [168] Admiral Watkins continued this emphasis on better strategic thinking in the Navy as he worked to develop a formal statement of the Maritime Strategy. In a 7 October 1982 message to the Fleet CINCs, he specifically mentioned those areas he considered vital to the Navy's future. Among those were "war-fighting readiness, the revitalization of the Naval War College as the crucible for strategic and tactical thinking, integration of the Naval Reserve into our war-fighting thinking, and improvement of interservice cooperation and mutual understanding." [169]

Again, these threats, constraints, and resources, taken together, were instrumental in the development of the Maritime Strategy. In particular, the emphasis on Soviet missions and strategies, on increasing naval readiness, and on thinking as a global maritime power led to the development of the forward maritime strategy[170].⁸ Yet, this kind of naval strategic thinking did not end with the publication of *The Maritime Strategy*, nor did many of the debates that were critical to its development[171]. Still, it did make naval strategic planners more aware of the threats, constraints, and resources that are fundamental to the strategy process. The next section examines these issues in the nuclear application of the Maritime Strategy.

3. The Nuclear Maritime Strategy⁹

The Navy's use of nuclear weapons must be considered essentially a subdivision or component of the broad Maritime Strategy. Moreover, for this study, the nuclear aspect of the Maritime Strategy is more applicable and provides greater implications for future U.S. national nuclear strategies. Yet, while deterrence and war termination are presented as fundamental elements of the Maritime Strategy,[172] there is

8. Already adopted by land and air forces as applied to the NATO strategy, forward defense was adapted by the Strategic Studies Group for the Navy and ultimately transformed into the forward maritime strategy.

9. Ref. [177] is one of the few unclassified sources that addresses the U.S. Navy's nuclear strategy within the context of the overall Maritime Strategy.

little discussion of actual employment of naval nuclear forces. Still, in Admiral Watkins words, "Maritime Strategy must consider the nuclear balance even during the conventional phase of the war." [173] Therefore, given that nuclear deterrence [174] and/or nuclear retaliation [175] are among the U.S. Navy's broad missions, a naval nuclear strategy is worth examination [176]. More importantly, the Navy's nuclear weapons capability must be examined from the same perspective of threats, constraints, and resources.

Several issues can be discussed when examining the U.S. Navy's nuclear weapons capabilities. For example, the issue of nuclear war at sea merits serious consideration and has been the subject of recent literature on naval strategy [177]. Another issue that is becoming increasingly debated especially in arms control discussions is the Navy's use of sea-launched cruise missiles (SLCMs). The remaining subjects involve the Navy's strategic nuclear forces, especially more recently the Trident SSBNs and the Trident II (D-5) SLBM. While each of these subjects can be discussed in great detail, it is beyond the scope of this study to do so. For purposes of brevity and consistency, however, this study's examination of naval nuclear forces will focus exclusively on the strategic component.

In short, the Navy's ballistic missile submarines (SSBNs) and associated submarine-launched ballistic missiles (SLBMs) represent the sea leg of the U.S. strategic nuclear

triad.¹⁰ Again, briefly, the role of this component within the Maritime Strategy is first deterrence then war termination, both made credible by the threat of retaliation. In order for that credibility to be maintained, the U.S. must demonstrate the resolve and possess the forces to execute such a nuclear strategy. Though interrelated, it is the latter that will be discussed here in terms of threats, constraints, and resources.

Since the Maritime Strategy is designed primarily to counter the Soviet threat on a global scale, it is the USSR's naval forces that are the greatest threat to U.S. SSBNs. Classified as antisubmarine warfare (ASW), this three-dimensional (air, surface, and sub-surface) threat is becoming increasingly more capable[178]. It includes such new generation platforms as the TU-142 Bear-F and Ka-27 Helix A ASW aircraft, Akula and Sierra nuclear-powered attack submarines, and Kirov and Udaloy surface combatants[179]. These and other late-generation platforms are being developed with more technologically advanced sensors and weapons systems, and, through increased training exercises, are improving the Soviet fleet's tactical ASW capabilities[180]. Moreover, research and development in such areas as quieting, propulsion systems, fire control, and communications adds potential to the increasingly

10. Although increasingly critics, especially from the Soviet Union, charge that the U.S. Navy's SLCMs have a strategic as well as tactical nuclear role.

capable Soviet threat[181]. Thus, the U.S. superiority in ASW that in the past has relied on advantages in technology and training is becoming increasingly threatened by these Soviet developments[182].

In addition to the advances in Soviet ASW, several other constraints are important to the future development of the U.S. Navy's strategic nuclear strategy. These include many of the same kinds of economic and budgetary, technological, and political constraints presented earlier. To begin with, the SSBN relies on communicating with shore-based facilities for everything from daily peacetime operations to retargeting instructions during wartime. Thus, limitations in the flexibility of communications particularly during a conflict are one handicap the SSBN presently suffers[183]. Another potential technological constraint is only theoretical at present but is more directly related once again to the Soviet threat. This has to do with a potential breakthrough in ASW that would make submarines more susceptible to detection. While this kind of development has been talked about for years, however, it remains improbable in the foreseeable future[184].

Primarily because of their mobility, SSBNs are considered the most "invulnerable" leg of the strategic nuclear triad. Yet, two different but related constraints may reduce this invulnerability in the future. First, arms control negotiations, especially the strategic arms reduction

talks (START), could drastically limit the number of SSBNs, or at least SLBMs, available as part of the triad[185]. Secondly, the U.S. program objective of 20 Trident submarines by approximately the year 2000 is nearly a 50 percent reduction in the current number of U.S. SSBNs[186]. Obviously, the result of both of these events would be fewer SSBNs in the U.S. arsenal. The fact that each Trident submarine carries more missiles than previous classes (24 vs. 16) and will eventually deploy the advanced Trident II (D-5) SLBM is not the issue here. The point is that with the advances in Soviet ASW technology and tactics including superior numbers of forces, fewer U.S. SSBNs implies greater vulnerability for the forces that do exist.

The U.S. Navy's future strategic nuclear arsenal will not only consist of fewer SSBNs but it will have less bases to homeport those ships[187]. Again, most of the advantages and invulnerability the SSBN enjoys result from its operational mobility. When the SSBN is in port, therefore, it becomes as easily targeted as the ICBM and, thus, just as vulnerable[188]. It follows then that fewer homeports further increases the SSBN's vulnerability by reducing the adversary's targeting problem.

Most of the remaining constraints are political in nature including those involving economic or budgetary issues. While much has been written about the high cost of weapons systems, it remains a constraint in the development of naval

nuclear strategy, especially as concerns force structure procurement. Other related constraints include the interservice rivalry over what constitutes the best force mix for the strategic nuclear triad,[189] and the uncertainty of escalation control in nuclear war[190]. While each of these constraints are individually different, they are similar in origin. That is, they essentially derive from the uncertainty inherent in the entire subject of nuclear war. With one exception, which is of little use today, the world has not experienced the use of nuclear weapons in war. As a result, the issue of nuclear war, and, hence, the development of nuclear strategy is often reduced to theory, however accurate. That, in itself, is probably the biggest constraint in the development of any nuclear strategy, naval or otherwise.

Finally, in the area of resources, again, the Trident SSBN and the Trident II (D-5) SLBM represent the future for the sea leg of the nuclear triad. The strategic modernization program initiated by the Reagan Administration assures the continued development of these systems. According to the FY 1989 Joint Military Net Assessment:

The modernization of the strategic SLBM force is continuing with the deployment of TRIDENT (Ohio-class) ballistic missile submarines. When the TRIDENT D-5 missiles are added to the inventory, they will provide a significant improvement in range, accuracy, and payload to complement the survivability and endurance inherent in SLBMs. These improvements will give the SLBM leg of the Triad the capability to retaliate against a full spectrum of targets, substantially increase the size of the nuclear-powered ballistic submarine patrol area, and provide an even greater

hedge against a Soviet breakthrough in antisubmarine warfare capability. Because of these new weapon system programs, the SLBM force should be more capable against a harder and more mobile Soviet target base.[191]

Moreover, in the words of Vice Admiral Daniel L. Cooper, Assistant Chief of Naval Operations (Undersea Warfare):

TRIDENT submarines provide the most effective strategic platform in the world today and foreseeable future. It is unsurpassed in the vital areas of survivability, reliability, responsiveness, flexibility, endurance, lethality, and connectivity. With the TRIDENT II (D-5) missile, it will be the most capable and cost effective strategic weapon system in the U.S. arsenal. . . . The TRIDENT weapons system is the keystone to our nation's strategic deterrence. It is a proven, mobile weapon delivery system which assures, most importantly, survivability, along with accuracy, and dependability and must continue as the most critical element to our nation's strategic force modernization program.[192]

Aside from these obviously positive remarks, it appears extremely likely that the Trident SSBN and the Trident (D-5) SLBM represent the Navy's long-range (future) strategic nuclear weapons systems. From the perspective of resources, therefore, the development of a naval nuclear strategy is simplified somewhat by the reduced uncertainty in the available forces (resources).

D. CONCLUSION

This chapter has presented the most recent statements of U.S. nuclear strategy as well as one armed services' declared military strategy with nuclear implications. The purpose in this examination of current U.S. strategies has been twofold. First, each of these strategies have developed as a function of threats, constraints, and resources. This formulation will

be useful in forecasting future strategies, the focus of the remainder of this study. Second, the examination of current U.S. nuclear strategies establishes the base point for the direction of strategy development for the future. Again, this is useful for the military strategic planner attempting to develop long-range U.S. nuclear strategies. Specifically, by analyzing current strategies and adapting them as necessary to fit predicted changes in the future security environment, planners are better able to develop long-range strategies. Later in this study this kind of analysis will be used to develop the "best" or "ideal" U.S. nuclear strategies for alternative future world scenarios. The next chapter presents the specific scenarios that will be used to postulate the future U.S. nuclear strategies.

V. ALTERNATIVE WORLD SCENARIOS FOR STRATEGIC PLANNING

A. INTRODUCTION

As the focus of this study is long-range strategic planning, this section will examine the future security environment through alternative world scenarios. Specifically, four scenarios from Charles W. Taylor's *Alternative World Scenarios For Strategic Planning* will be presented as probable environments for the long-range (i.e. 20-30 years) future. It is important to remember that forecasting involves uncertainty and, by exploring probable futures, alternative scenarios provide only a means of reducing that uncertainty. Thus, while a set of alternative futures scenarios taken together might encompass the "most probable" future, no one scenario is likely to describe the future that will actually occur[193]. Nevertheless, the alternative futures methodology is useful in describing the future security environment for the strategic planner interested in developing a long-range military strategy for the United States.

Several scholarly studies have examined the long-range future security environment for the purpose of presenting alternative military strategies for the United States[194]. Taylor's book was chosen for this study because its conclusions about the future environment closely approximate those of other contemporary works. Moreover, this particular book

has been critically examined by selected scholars who concluded that its methodology and scenario outlines are sound and plausible[195].

One of the most difficult tasks in using the alternative futures methodology is the actual creation of the scenarios. Utilizing Taylor's book for this study, therefore, eliminates the process of developing plausible alternative futures. Moreover, while Taylor discusses the methodology used in developing his scenarios, it is assumed valid as already indicated, and, therefore, will not be examined in any detail here.

Finally, Taylor's book is specifically designed to address long-range strategic planning for the Department of the Army, and, thus, postulates a future Army force structure for each scenario. Nevertheless, it is the specific scenarios themselves rather than the emphasis that are important to this study. Moreover, the critics of the book concluded that its "utility can be extended to other areas of long-range military planning." [196] Thus, the utility of Taylor's book for this study is its examination of plausible scenarios for the future security environment. More importantly, from its scenarios will be derived those elements within the categories of threats, constraints, and resources useful in the formulation of nuclear strategy. The next step will be to develop a U.S. nuclear strategy that will fit into each future scenario.

B. THE EARLY DECADES OF THE 21st CENTURY

1. Introduction

By focusing on the years 2005 and 2020, Taylor's four scenarios provide a useful framework for midrange to long-range military strategic planning. Moreover, these particular time periods were chosen to relate current underlying conditions for policymaking and decisionmaking to the early decades of the 21st century. In this way, the scenarios "provide a background for planning alternative strategic courses of action and assessing defense policies as well as provide a framework for exploring long-term defense requirements." [197]

This section of the study will briefly present the assumptions and trends central to the four alternative world scenarios in Taylor's book. In addition, it will highlight those trends (later defined as "scenario drivers") that are critical to national and international issues for the United States. Finally, there will be a brief discussion of the key attributes or variables that are used to distinguish one scenario from another.

2. Assumptions

Any study's conclusions are based on a given set of conditions or assumptions that serve to limit its scope. Therefore, assumptions are useful not only in restricting a study to certain sets of conditions, but also in preventing highly unexpected or catastrophic events from invalidating its

results. The assumptions used in Taylor's study are purposely broad yet designed to support the trends and events that are central to a stable world environment in each scenario. They include:

- no general (i.e. world or major) wars, nor a war between the U.S. and USSR or among other major powers will occur
- neither a worldwide economic collapse nor major world depression will occur during the next 30 years
- no major scientific or technological breakthrough will occur that will give one world nation the ultimate power of intimidation over all others[198]

3. Trends

Forecasting of any kind, especially that associated with creating alternative future environments (scenarios), is heavily dependent on extrapolating current trends into the distant time period in question. This includes predictions of economic, demographic, sociopolitical, and military-technological conditions that will shape the future environment and directly affect any nation's security strategy. Taylor's future security environment is a more interdependent, multipolar world with an increasing population but decreasing supplies of raw materials. Additionally, the world is more competitive economically than militarily but a proliferation of conventional and nuclear weapons as well as advances in science and technology continue to foster security risks. Finally, the creation of new industrial and economic infrastructures results in sociopolitical changes that increasingly

affect all nations of the world and cause a rise in nationalism in many[199].

a. Scenario Drivers

Those trends that are particularly critical to national and international issues are referred to as "scenario drivers." Specifically, they include those trends "that shape the political, economic, social, technological, and military future of the United States and its relationships with other nations of the world." [200] As such, the drivers set the themes for the alternative futures and, at the same time, distinguish one scenario from the other. Still, the drivers for each scenario are similar as they focus on those issues that are central to U.S. national defense. Four basic drivers are used to describe each scenario and will be discussed in more detail later.

b. Attributes

Related to and dependent on the scenario drivers are what Taylor calls the scenario "attributes." Very simply, the scenario attributes are variables that describe the individual makeup of each scenario qualitatively and quantitatively. The number of U.S. military forces deployed overseas would be an example of a scenario attribute. Even more than the drivers, the attributes help distinguish one scenario from another. Moreover, the scenario attributes

provide planners with specific data which makes the structuring of a national military strategy for each scenario more realistic[201].

4. Summary

This section of the study briefly introduced the assumptions and trends used by Taylor to generate the four scenarios in his *Alternative World Scenarios For Strategic Planning*. Not surprisingly, the assumptions and especially the trends describe a future that will be very different than today. Apparently national security strategies will have to place more emphasis on economic matters as well as on military issues. Moreover, an entire new spectrum of threats could be expected given the sociopolitical and military-technical changes worldwide. The next section will describe each scenario in more detail including the drivers that distinguish each. More importantly, from each scenario will be determined those elements within the categories of threats, constraints, and resources that are essential to the development of an appropriate national nuclear strategy.

C. SCENARIOS¹¹

1. Introduction

Again, Taylor's scenarios address two specific time periods for military strategic planning: the years 2005 and 2020. Since the focus of this study is on long-range strategic planning, the scenarios will be presented primarily from the 2020 perspective. The 2005 time period will be only briefly discussed as necessary to explain the transition of trends up to the year 2020. Moreover, 2005 corresponds more closely to midrange rather than long-range planning for the purposes of this study.¹²

The basic drivers for each scenario are, again, national and international in scope and emphasize political and economic issues that are appropriate for military planning. Moreover, while the four basic drivers for the scenarios are all similar, it is their differences that allow one scenario to be distinguished from another. As such, they help in determining those elements that should be considered in the development of a nuclear strategy for each scenario. These

11. The description of the four scenarios comprises a major portion of Taylor's book. For reference purposes, then, what follows is essentially a paraphrase of the book's presentation of each scenario.

12. Long-range strategic planning is generally considered to encompass the timeframe of 10 to 25 years. Less than 10 years is usually not enough time for significant changes to occur that would require creating new strategies. On the other hand, beyond 25 years often becomes intellectually difficult to conceptualize. Nevertheless, the 30 year period in Taylor's scenarios is adequate for this study.

drivers will be listed individually at the beginning of each scenario description. A more detailed examination of each scenario will follow and expand upon the themes presented by the basic drivers. In addition, the expanded description will both highlight and summarize those elements of threats, constraints, and resources that are significant within each scenario for the development of a nuclear strategy.

2. Scenario ALPHA: U.S. Isolationist

a. Scenario Drivers¹³

- U.S. national political leaders advocate a strong welfare, social investment economy
- Western postindustrial infrastructures, along with specialty industries, lack the capacity to support national mobilization plans within the WW II framework
- The rise of nationalism worldwide has suppressed U.S. international influence and has precluded U.S. military presence overseas
- U.S. community infrastructures (economies, politics, demographics, resources, attitudes and values, etc.) inhibit military (stationing) requirements and reduce installation investments

b. Threats

The absence of major wars for the past 30 years in combination with widespread and rapid economic growth has led to a relatively peaceful world. While the U.S. perception of external threat is low, however, the world is still a

13. The description of the basic drivers for each scenario is taken from Table 7 in Taylor, p. 29. This lists the four drivers arranged in order of theme dominance for each scenario.

highly competitive one, albeit more economically than militarily. Moreover, in 2020 trends indicating possible economic recession have caused most nations of the world to arm themselves with the latest weapons to protect their national interests. Specifically, some 60 percent are armed with early 21st century conventional weapons; 20 percent possess the latest high-tech weapons and weapons systems; and 13 percent have nuclear weapons and the capabilities to deliver them.

The Soviet Union remains a formidable military power in 2020 although its shift in focus to primarily internal economic and social interests has resulted in a more defensive military posture. Moreover, the USSR is becoming increasingly more adventuresome and unpredictable economically rather than militarily. Nevertheless, the Soviet Union's communist ideology as well as its historic and traditional socialist goals remain strong.

c. Constraints

The shift in focus to primarily social welfare programs has placed defense at the low end of U.S. priorities resulting in an economically constrained military. Moreover, the U.S. enters the year 2020 in a mild economic slump, further constraining military programs. The U.S. military's global strategy is politically constrained by the worldwide rise in nationalism as stated in the scenario drivers above. This is mostly due to the expulsion of U.S. forces from overseas bases and port facilities.

Demographically in 2020, the U.S. population is older and more conservative with a greater proportion made up of ethnic minorities. U.S. citizens are more concerned about community and environmental issues and less so about the military and international involvement. This attitude combined with the overall growth of the U.S. population has inhibited defense investments and precluded military installations anywhere near cities.

One final area to be considered here, but equally applicable to the category of resources, is the disappearance of heavy industry in the United States (and other Western postindustrial nations). Because the heavy industry needs are imported, U.S. infrastructures in 2020 lack the capacity to support a World War II type of national mobilization.

d. Resources

The area of resources is closely associated to the category of constraints since the development of a military strategy and supporting force structure are heavily dependent on the available resources. In 2020, the manpower resource available for military service is becoming increasingly limited as the U.S. population ages. Even so, most of the returning forces that were expelled from overseas bases have been deactivated or assigned to the Reserves. Still, the peacetime joint/unified force (formed during the 2005 reorgan-

ization of the armed forces) remains adequate for most contingencies within a one-war strategy.

The loss of heavy industry in the U.S. has been replaced by increasing numbers of light, specialty industries resulting in a high-tech oriented military force structure. Examples are the armed forces' use of robotics, intelligence and antiweapons provided by advanced space technology, and computer simulated training.

3. Scenario BRAVO: U.S. World Peacekeeper

a. Scenario Drivers

- A tradeoff of nationalism worldwide for economic development has strengthened U.S. international influence and preserved U.S. military presence overseas
- Western postindustrial infrastructures, along with specialty industries, adequately buttress national mobilization plans within the WW II framework
- U.S. national political leaders advocate a strong military defense
- U.S. community infrastructures (economies, politics, demographics, resources, attitudes and values, etc.) underpin military (stationing) requirements and installation investments

b. Threats

The broad transfer of technology in combination with many new ad hoc economic and security agreements have generated an increased frequency of trade wars and political and economic power competitions. As a result, most nations of the world are highly armed to protect their interests in this extremely competitive scenario of 2020. This includes a 40

percent increase since 1995 of those states with nuclear weapons and delivery systems capability. Not surprisingly, the U.S. and its allies perceive increasing external threats, both economic and military, to their national interests in this scenario.

The Soviet Union is primarily focused on its internal economic development which remains far behind that of the United States. Moreover, while the USSR continues to support its client states, it has allowed economic cooperation between many East European nations and Western Europe. Nevertheless, the Soviet Union has increased its military forces and is a larger threat to world peace and more militarily adventuresome than it was in 1990. The European sector of the Soviet Union in particular remains highly capable of waging war including worldwide military intervention. In addition, like the U.S., the USSR maintains a substantial nuclear weapons capability despite strategic nuclear arms reductions.

c. Constraints

Unlike the ALPHA scenario, this one presents few constraints for the military as the U.S. defense sector in general is well respected domestically as well as internationally. While the loss of heavy industry is still a problem, the U.S. is now a world leader of high-tech products, services, information, and knowledge programs and systems. Moreover, U.S. achievements in science and advanced technology combined with the growth of specialty industries have offset

the economic loss of heavy industries. This has allowed the U.S. by 2020 to regain the capacity to support national mobilization plans for most contingencies within the World War II framework. These same developments provided by the new specialty industries have reduced the U.S. trade deficit which had increased during the early part of the century.

As with the previous scenario, social welfare programs consume the major portion of the national budget. The difference with this scenario, however, is that in size of national expenditures social investments are directly followed by a large defense budget. Moreover, the current Congress, Presidential Administration, and general populace all support extensive military programs. Finally, despite arms control negotiations resulting in strategic nuclear weapons reductions, the U.S. retains a substantial nuclear capability.

d. Resources

The United States is universally recognized as the most advanced military power of the world in 2020. Moreover, its international economic, sociopolitical, and moral influence is unsurpassed by any other state. This strengthened international influence, in combination with the tradeoff of nationalism for economic development by most industrial nations, has preserved a large U.S. military presence overseas. The U.S. military is seen as necessary and widely respected domestically as well. Indeed, most of the general population has accepted and approves of the 2005 military policy of

sharing military facilities with communities to assist in their development. Also enacted in 2005 is the Universal Public Service program which provides the community and the military with qualified Americans through extensive training in an agency of the Federal Government. Finally, the development of plastic (polymer) munitions and lightweight, high-impact armor plate has made the U.S. military more self-sufficient. While technological achievements and innovations have reduced the number of military personnel, however, overall training requirements have increased.

4. Scenario CHARLIE: Neonationalism

a. Scenario Drivers

- The rise of nationalism worldwide has suppressed U.S. international influence and has precluded U.S. military presence overseas
- U.S. community infrastructures (economies, politics, demographics, resources, attitudes and values, etc.) inhibit military (stationing) requirements and reduce installation investments
- U.S. national political leaders advocate a strong military defense
- Western postindustrial infrastructures, along with specialty industries, lack the capacity to support national mobilization plans within the WW II framework

b. Threats

U.S. economic aid over the past two decades has helped transform many of the Third World countries into modern industrial nations, with many even adopting more representative forms of government. At the same time, however, many of these countries turned to a revived nationalism as they felt

their cultures increasingly threatened by the technological changes that accompanied industrialization. As a result, these and most other nations of the world have become heavily armed to protect their interests in this economically competitive world. This includes not only late 20th and early 21st century conventional and high-tech weapons, but many with nuclear weapons capabilities as well. In fact, the number of nations with nuclear weapons and delivery systems in 2020 has increased by two-thirds since the 1990s and by 25 percent since 2005.

Concentrating primarily on economic and social development, the Soviet Union in 2020 has reduced its support for client states and is militarily less adventuresome than it was two decades ago. In cooperation with the United States, the USSR has reduced its nuclear arms inventory and allowed for inspection and verification of its arsenal, though it retains a formidable warfighting capability. Moreover, the Soviet Union has maintained a peaceful coexistence with Western Europe and since 2005 has withdrawn most of its forces from Eastern Europe. Thus, while it still retains a conventional military capability, the Soviet Union does not pose a threat to Western Europe in 2020.

c. Constraints

The worldwide revival of nationalism has significantly suppressed U.S. political, economic, and military influence, especially in Third World countries. Moreover,

those nations that previously maintained security agreements and treaties with the U.S. have nationalized foreign industries and expelled all Westerners. This includes the reclaiming of all military bases on their territories and denying overflights and port visitation rights to all U.S. nationals and other Western foreigners. As a result, the U.S. has withdrawn all of its military forces from its overseas bases by 2020 and is forced to rely its own stockpiles of strategic resources. This is even more critical since nearly all U.S. heavy industries, including arms manufacturers, have relocated to foreign industrial nations. The U.S. in 2020 is, therefore, left without the capacity to support any kind of national mobilization plans similar to those required during World War II.

The increasing migration of skilled workers to the city during the past 15 years has resulted in the growth of megalopolises, including their expansion adjacent to military installations. As a result, in 2020, more demands are being made for the military to close their installations and find other locations. Thus, while the general public opinion of military service is high, U.S. community infrastructures tend to inhibit military stationing requirements and reduce installation investments in this 2020 scenario.

d. Resources

Military end strength is low in 2020, mostly as a result of the deactivation (or assignment to the Reserves)

of forces returning from overseas. Nevertheless, U.S. investments in technologically advanced, mostly space-related, military systems have reduced the requirements for massive armed forces in 2020. Moreover, lightweight munitions ordnance and armor plate designs by the U.S. high-polymer plastic industry have offset the loss of heavy industry and somewhat lessened the requirements for national mobilization. Finally, the DoD's long-range defense plans and budgets, approved by Congress, continue to emphasize the acquisition of advanced technological equipment and weapons to maintain readiness with a minimum of combat forces. Qualified personnel are provided to the military and other Federal and state government agencies by the Universal Public Service program after extensive training.

5. Scenario DELTA: Muted Bipolar World

a. Scenario Drivers

- U.S. community infrastructures (economies, politics, demographics, resources, attitudes and values, etc.) inhibit military (stationing) requirements and reduce installation investments
- U.S. national political leaders advocate a strong welfare, social investment program
- Western postindustrial infrastructures, along with specialty industries, lack the capacity to support national mobilization plans within the WW II framework
- A tradeoff of nationalism worldwide for economic development has strengthened U.S. international influence and preserved U.S. military presence overseas

b. Threats

By 2020, many nations have traded off the nationalism that had been growing worldwide since the turn of the century for economic security and development. The U.S. has been instrumental to these nations not only by granting financial assistance, but, more importantly, by providing a security umbrella. With this arrangement, the external threat to U.S. and allied interests is generally perceived to be about the same as it was in the early 1990s. Even so, most nations of the world remain heavily armed with conventional weapons, and many additionally possess more modern high-tech weapons systems. Moreover, the number of nations with nuclear weapons and delivery systems has doubled since 2005 and is approximately 40 percent greater since 1995.

The Soviet threat is perceived by the U.S. to be slightly less than it was in the early 1990s. This is mostly due to the USSR's concentration on internal economic problems. Moreover, this focus on internal economic development has made the Soviet Union less of an immediate threat to Western Europe. Nevertheless, with its substantial conventional weapons capabilities, the Soviet Union remains a formidable warfighting power in 2020. This, and the fact that it continues to militarily train and provide arms to its client states, makes the Soviet Union still a potential threat to the free world.

c. Constraints

Most U.S. communities in 2020 are economically viable, environmentally aware, and geographically expanding, and, therefore, oppose the presence of military installations even remotely close to major cities. Demographically, the U.S. is largely represented by an older population and one that is approaching 40 percent combined minority (i.e. blacks, Hispanics, and Asians). This has politically, economically, and socially impacted the United States both internationally and domestically. Specifically, U.S. national political leaders in 2020 advocate comprehensive national social welfare programs and investments as a top priority. These Federal social welfare programs are followed by, in order of priority, investments in education, space, science and technology, and, only lastly, defense programs.

As in the previous scenarios, this one is characterized by the relocation of U.S. heavy industries to foreign nations from which the U.S. imports such needs. Because of this, most Western strategic analysts believed two decades ago that the Western postindustrial infrastructures lacked the capacity to support national mobilization plans in the event of a major war. The growth of specialty industries like plastics (polymer), however, has proved this wrong with the development of special ordnance, lightweight, high-impact armor, and building construction beams.

d. Resources

Already mentioned, but significant here, is the growth of specialty industries in the U.S., such as plastics and high-technology systems and materials. These industries in fact support a flourishing economy, which makes the United States the leading postindustrial nation in the world in 2020. Moreover, U.S. international political, economic, and military influence has been strengthened by its assistance to those many nations that have traded off nationalism for economic security and development. This has also preserved the United States military presence overseas, including bases, port facilities and other installations. In contrast, however, is the domestic opposition to military bases and installations from U.S. communities that are more environmentally oriented and overwhelmingly support social welfare programs before anything else.

D. SUMMARY

The scenarios from Charles W. Taylor's *Alternative World Scenarios For Strategic Planning* represent four possible futures for the year 2020. As such, they provide the long-range strategic planner with alternative views and considerations that are helpful in the development of a strategy for that time frame. As demonstrated in this study's review of past strategies, the development of any long-range strategy must start with an analysis of the key elements of threats,

constraints, and resources. For that reason, Taylor's four scenarios were presented in this study from that perspective.

It is clear from an examination of the basic drivers that the four scenarios share common themes in the year 2020. For example, the relocation of U.S. heavy industry to foreign nations is common to each scenario. This is not unusual, however, as certain trends and events are to be expected in most any future scenario since they are based on extrapolating current knowledge to that time period. Indeed, what distinguishes different scenarios from one another is the combination of those key elements of threats, constraints, and resources.

Again, the purpose of this section of the study has been to present the alternative futures methodology as a useful tool for the long-range military strategic planner. More specifically, the four alternative world futures serve as models of the future security environment for the development of a long-range U.S. nuclear strategy. While the scenarios do not explicitly present alternative nuclear futures, they do provide a general environment for the development of such a strategy for the U.S. As a result, these scenarios will be used in the next chapter to postulate U.S. nuclear strategies based on changes in the long-range future security environment. Table 3 summarizes the various threats, constraints, and resources for each scenario.

TABLE 3

SCENARIOS SUMMARY

<u>Scenario</u>	<u>Threats</u>	<u>Constraints</u>	<u>Resources</u>
ALPHA	Peaceful World	Loss Of Heavy Industry	Manpower Limited
	Economic More Than Military	Loss Of Overseas Military Presence	Growth Of Light And Specialty Industries
	USSR Still Primary	Less Domestic Support For The Military And Reduced Defense Spending	
	Nuclear And High-Tech Conventional Proliferation	Mild Economic Slump	
BRAVO	Extremely Competitive World	Arms Control	World Leader Of High-Tech Products, Services, Information, Knowledge Programs And Systems
	USSR Still Primary Military Threat	Social Welfare Programs And Investments Consume The Major Portion Of The Budget	
	Nuclear And Conventional Weapons Proliferation		Development Of Plastic (Polymer) Munitions Ordnance And Lightweight High-Impact Armor Plate

TABLE 3 (Continued)

<u>Scenario</u>	<u>Threats</u>	<u>Constraints</u>	<u>Resources</u>
CHARLIE	Worldwide Nationalism	Loss Of Military Presence Overseas	Investment In Technologically Advanced, Space-Related Military Systems
	Nuclear And Conventional Weapons Proliferation	Loss Of Heavy Industry Including Arms Manufacturers	Development Of Lightweight Munitions Ordnance And Armor Plate By Specialty Industries Like High-Polymer Plastics
	USSR Threat Reduced	Expanding Population And Growth Of Cities Forces Closure Of Many Military Installations	
DELTA	Generally The Same External Threat As The Early 1990s	Domestic Economic, Political, And Social Constraints	Growth Of Specialty Industries Such As Plastics And High-Technology Systems And Materials
	USSR Threat Slightly Less	Make Defense And Military Spending Last Among National Priorities	U.S. Military Presence Overseas Is Secure
	Nuclear And Conventional Weapons Proliferation	Relocation Of U.S. Heavy Industries To Foreign Nations	

VI. THE "IDEAL" U.S. NUCLEAR STRATEGY FOR EACH SCENARIO

A. INTRODUCTION

As the title indicates, the purpose of this section of the study is to develop a U.S. nuclear strategy for each of the scenarios presented in the previous chapter. Since this study has examined the development of past U.S. nuclear strategies from the perspective of threats, constraints, and resources, the same will be used here. It should be pointed out once again that the development of any national security strategy requires essentially the same type of process[202]. First, an articulation of national interests must be developed from the nation's core values (e.g. personal freedoms, rights of the individual, etc.). Second, the national interests must be translated into broad goals or objectives that support those interests. Next, an assessment must be made of the international security environment including the major threats to the national interests. This also includes forecasting future threats and changes in the environment as well as analyzing current trends. Finally, the development of a national security strategy, however specific (e.g. nuclear strategy), follows from considering the above factors in light of constraints and resources.

A major assumption of this study is that basic U.S. interests and goals remain fundamentally the same in the time

frame of analysis. As alluded to above, these include "values such as human dignity, personal freedom, individual rights, the pursuit of happiness, peace and prosperity." [203] In addition, the specific national interests which the U.S. national security strategy seeks to assure and protect include:

- The survival of the United States as a free and independent nation, with its fundamental values intact and its institutions and people secure.

- A healthy and growing U.S. economy to provide opportunity for individual prosperity and a resource base for our national endeavors.

- A stable and secure world, free of major threats to U.S. interests.

- The growth of human freedom, democratic institutions, and free market economies throughout the world linked by a fair and open international trading system.

- Healthy and vigorous alliance relationships. [204]

Admittedly, one could imagine environmental changes that could change U.S. interests, but that is beyond the scope of this study. At the same time, though perhaps more a matter of definition, one could argue that these core U.S. values and interests do in fact remain constant regardless of changes in the international environment. Nevertheless, for this study, it is the environment that changes in the future scenarios, especially the threats, constraints, and resources that are fundamental to strategy development. The one exception is that the last U.S. national interest from the above list is likely to change in character. In other words, for this study "healthy and vigorous alliance relationships" may mean those

that are less rigid and formal and more economic than military in nature.

The nuclear strategies presented for each scenario are intended to be broad statements rather than "bean counting" plans for the specific employment of forces and weapons systems. Still, the discussion of force structure and general targeting plans is a fundamental part of any nuclear strategy formulation. For example, such factors as the offensive/defensive force structure orientation, countervalue/counterforce targeting options, and even the viability of maintaining the nuclear triad will be explicitly considered in each scenario. As with the historic U.S. nuclear strategies, the future alternative strategies will be explained in terms of the specific threats, constraints, and resources that characterize each future scenario.

Two other assumptions of this study are concerned more directly with the future existence and/or utility of nuclear weapons themselves. First, nuclear weapons will continue to exist in the future. That may seem a foregone conclusion given that one purpose of this study (i.e. this section) is to consider U.S. nuclear strategies for alternative future scenarios. Yet, based on current and predicted future domestic and international constraints,¹⁴ it must be concluded that one

14. Like, for example, budgetary and economic constraints, moral considerations, environmental and natural resources constraints, and other similar ones presented earlier in the study.

possible alternative nuclear future (however remote) is complete and universal disarmament[205]. Moreover, even U.S. and USSR national leaders have advocated this position and have gone so far as to set time tables for its achievement[206].

Second, the primary objective of nuclear weapons and nuclear strategy in the future will remain deterrence of nuclear war. According to Dennis Drew and Donald Snow, "the basic concern in developing nuclear strategy is finding the best means to convince potential adversaries not to use their nuclear forces." [207] While this objective has been central to U.S. nuclear strategy from the beginning, however, the nature of deterrence has changed as the strategy evolved[208]. Moreover, according to Philip Bobbitt, "the 1980s witnessed a widespread disillusionment with the idea of strategic deterrence, the principal concept that had unified postwar nuclear doctrine." [209] Nevertheless, most of these changes in or disillusionment with nuclear deterrence have resulted from variations in the perceived international environment as characterized by different threats, constraints, and resources. No matter how it is defined, however, deterrence will continue to be the first priority of a future U.S. nuclear strategy.

It is important to point out, however, that while deterrence remains the primary objective, the U.S. nuclear strategy must provide for the possible scenario where deterrence fails. This issue was previously mentioned in the discussion of the

Maritime Strategy. Recall, for example, the quote from Admiral Watkins' unclassified version of the Maritime Strategy: ". . . should deterrence fail our strategy relies on forward defense and allied cooperation to bring about war termination on terms favorable to ourselves and our allies." [210] Therefore, the actual employment of nuclear weapons (i.e. warfighting) is as much a part of U.S. nuclear strategy as the primary objective of deterrence. This particular subject will be discussed in more detail later in the study.

While there are many variations of possible future U.S. nuclear strategies, in general, the range of options can be reduced to essentially three choices. These include: maintain the current strategy and force structure; reduce the forces to fit a minimum deterrent/assured destruction strategy; or develop strategic defenses for a more balanced force structure/strategy [211]. Since these choices, again, characterize only the most general range of options for future U.S. nuclear strategies, more explicit alternatives and the key components of each will be presented later.

Most of the debate on this subject involves not only the offensive/defensive issue but, more importantly, the difference between a strategy of deterrence and a war-fighting strategy [212]. It is the conclusion of this study that these two strategies are not mutually exclusive. In other words, building up offensive and defensive capabilities to improve a

nuclear force structure's warfighting capacity may actually enhance the credibility of deterrence.

This discussion of deterrence and war-fighting brings up one final issue--the objectives of the U.S. nuclear strategy. Again, these objectives are not all inclusive nor are they novel[213]. Instead, they are the factors considered most important in this study to the development of a nuclear force structure that supports the national nuclear strategy. The first objective of deterrence has already been mentioned and needs no further discussion at this time. The remaining objectives fall under the category of war-fighting characteristics and become more important if the first objective of deterrence should fail. At the same time, at least in the opinion of this researcher, the war-fighting characteristics of these other objectives of nuclear strategy tend to complement the main objective of deterrence.

First, the force structure that supports the nuclear strategy must provide some means for limiting damage to the U.S., again, if deterrence fails. Mostly, this means developing and maintaining some form of strategic defense systems. Second, if nuclear war is initiated as a limited conflict, the U.S. nuclear strategy should provide the capability for escalation control. Not only does this objective support the previous one of damage limitation, it also prevents an adversary from controlling U.S. objectives by threatening larger scale attacks. Finally, a U.S. nuclear strategy should allow

for nuclear war termination that is acceptable to American interests and supports national objectives. This means maintaining a survivable reserve force for the purpose of threatening the enemy with further damage unless the war is terminated on U.S. terms. As a result, while related to the previous two, this objective includes more specific requirements for limiting damage to the nuclear force structure. In addition to strategic defenses, this objective includes enhancing the force structure through such things as hardening and mobility.

These objectives clearly represent the ideal characteristics of a future U.S. nuclear strategy. Recall, however, that the objective of this chapter is to present the "ideal" U.S. nuclear strategy for each scenario based on the specific threats, constraints, and resources. Moreover, just as any one scenario is unlikely to represent the actual future environment, the postulated nuclear strategies also may not be completely realistic. Nevertheless, again, this kind of analysis is useful to the long-range military strategic planner. Specifically, as concerns the development of a future U.S. nuclear strategy, it allows the planner to consider the important elements in one vital area--the environment.

B. SCENARIO ALPHA

Although this scenario describes a relatively peaceful world that has been without any major war for the last 30 years, there still exists a latent threat to U.S. interests.

Mostly, this threat is due to the general rise in worldwide nationalism resulting from economic prosperity. Moreover, not only are most nations heavily armed but the number with nuclear weapons capabilities has significantly increased since the end of the twentieth century. As a result, "world conditions in 2020 make U.S. reliance on nuclear deterrence more critical than it was at the turn of the century." [214] At the same time, this rise in nationalism has eliminated U.S. military presence overseas, reduced the American international influence, and virtually eradicated the former alliance structures. This has reduced the need for extended deterrence and made the U.S. more isolationist politically, militarily, and economically.

Coupled with these international events, U.S. domestic constraints have made defense in general a low priority and significantly reduced overall military spending. This encompasses all areas of the armed forces including research and development and even modernization of nuclear weapons programs. The combination of these factors has made the U.S. shift to a nuclear strategy of assured destruction that is supported by a minimum deterrent force posture.

The expanding U.S. population and growing community protests have led increasingly to the closure of local military bases including nuclear weapons facilities. This has forced the defense community to reorganize the entire military force structure and place more emphasis on remote naval bases.

As concerns the nuclear forces, the greatest effect has been a shift from a relatively balanced triad to an overwhelming emphasis on the sea-based component. This specific reorganization of the nuclear forces has accomplished a couple of important objectives. First, the SSBN force has long been recognized as the most survivable leg of the nuclear triad. Thus, by preserving and enhancing this component, the credibility of the U.S. nuclear deterrent is maintained. At the same time, the longer-range and more accurate SLBMs now deployed on the SSBNs reserve a warfighting counterforce capability while reinforcing the assured destruction/countervalue targeting U.S. nuclear strategy. Second, because these weapons are deployed at sea, they are in effect out of sight of the general public and, hence, not subject to protests.

The overall defensive posture of the U.S. military and, in particular the nuclear deterrent strategy, have been strengthened by "the deployment of a limited, strategic missile defense system in space." [215] Nevertheless, again, defense continues as a low priority as reflected by drastically reduced military spending. This justifies the shift in U.S. nuclear strategy to assured destruction/minimum deterrence. Other than developments in strategic defenses, the one exception to reduced defense spending is the continued modernization of naval strategic nuclear forces.

C. SCENARIO BRAVO

This scenario represents an extremely competitive world environment, both militarily and economically, in the year 2020. In addition to the USSR military buildup, most nations of the world are heavily armed with conventional, even high-tech weapons. Moreover, partly due to the broad transfer of technology, the number of nations with nuclear weapons capabilities has increased by 40 percent since 1995. At the same time, the U.S. is recognized by most nations as the foremost economic and military power in the world. As a result, U.S. international influence is strong and its overseas military presence is growing. In addition, ad hoc yet formal bilateral economic and political/military agreements have replaced the former rigid international alliance structures. This world situation has made the U.S. security umbrella and extended deterrence more important than ever.

Domestic support (both national leadership and the general population) for the military, strong national pride, and the perceived greater world threat have combined to allow substantially increased U.S. defense spending. The result has been new and more extensive research and development programs and general buildups in all areas of the military, especially the nuclear forces. All three legs of the nuclear triad have been strengthened and modernized as have the tactical nuclear weapons systems. This offensively-oriented force structure

allows for flexible targeting (mixed counterforce/countervalue) and supports the U.S. balanced warfighting nuclear deterrent strategy.

Strategic nuclear arms reductions by the United States and the Soviet Union in the early part of this century have had little effect on the force structures in 2020. The one exception for the U.S. was delays in establishing some form of strategic defense systems but more recent developments in space technology have overcome this early disadvantage. Thus, U.S. nuclear strategy in 2020 is still fundamentally one of deterrence but it is made more credible with a more balanced warfighting force structure.

D. SCENARIO CHARLIE

The rise of worldwide nationalism is even more pronounced here than in Scenario ALPHA but likewise has suppressed U.S. international political, economic, and military influence. Moreover, the elimination of U.S. military presence overseas includes not only the loss of bases but denial of port visitation and overflight rights. These events have made the extended deterrent component of U.S. nuclear strategy essentially obsolete in 2020.

Overall the external threats to U.S. interests are more economic in nature than military or political. Nevertheless, most nations of the world are heavily armed to protect their interests in this economically competitive environment where trade wars and restrictions abound. This includes a 25 per-

cent increase in the number of nations with nuclear weapons capabilities since 2005. More than anything else, it is this growing proliferation of nuclear weapons capable nations that has made the U.S. continue to rely on some form of nuclear deterrent strategy.

A description of the exact form of nuclear deterrent strategy employed by the U.S. in this scenario actually begins with a review of the various constraints presented earlier. First, U.S. strategic nuclear forces have been moderately reduced by late twentieth century bilateral arms control agreements with the Soviet Union. Moreover, increased national focus on social welfare programs has recently reduced defense spending and further constrained U.S. strategic nuclear force levels. At the same time, the targeting requirements have increased mostly as a result of the proliferation of nuclear powers. This has placed even greater demands on the already limited U.S. nuclear force structure, although it is offset somewhat by the elimination of the extended deterrence requirements. In addition, the expanding U.S. population and growing community protests have forced the closure of bases and other military installations including nuclear weapons facilities. As a result, most of the forces in the nuclear triad increasingly are being concentrated in the sea-based component.

In contrast, U.S. national leaders advocate a strong defense and the general public opinion of military service is

high. Thus, most in the U.S. believe that the maintenance of a nuclear deterrence strategy of some form is in the national interest. This support over the past several decades has provided the U.S. with a strong technological base and continued extensive military research and development programs. Consequently, the U.S. military has benefited greatly from developments in advanced technology, especially that utilizing the space dimension. The most apparent benefits for U.S. nuclear forces in 2020 have been in the area of strategic defenses.

Added together, these factors have produced a U.S. nuclear strategy in 2020 that is referred to as balanced minimum deterrence. Very simply, this means a smaller offensive nuclear force structure concentrated mostly in SSBNs and targeted mainly against enemy countervalue assets that is balanced by developments in strategic defense.

E. SCENARIO DELTA

Many nations of the world in this scenario have traded nationalism for economic security and development. As the leading postindustrial nation of the world in 2020, the U.S. has been the chief provider for these nations. This has not only strengthened U.S. international political, economic, and military influence but preserved its military presence overseas. Even so, most nations remain heavily armed and the number with nuclear weapons capabilities has doubled since

2005. Other external threats to the U.S. remain relatively the same as they were in the early 1990s. The one exception is that the Soviet threat even to Western Europe is slightly less as the USSR is more concerned with internal economic development. Accordingly, the requirements for U.S. extended nuclear deterrence are slightly less in 2020 though the policy remains viable and includes more recipients.

While the threats in 2020 may be similar to those of the 1990s, domestic constraints are more pronounced. The emphasis by U.S. political leadership on social welfare programs and investments has significantly reduced military spending. Moreover, in addition to social welfare programs, defense follows, in order of priority, investments in education, space, and science and technology. At the same time, an older and more ethnically represented U.S. population opposes military investments and installations that might be harmful to the environment or consume valuable resources. This kind of vehement opposition has forced the closure of several local bases and other military installations including nuclear weapons facilities near many growing communities.

As related to nuclear strategy, these constraints have made the U.S. rely on fewer numbers of forces to support its policies. More importantly, the closure of bases in particular has forced the U.S. to concentrate the majority of its nuclear weapons in sea-based platforms (SSBNs) homeported

locally and overseas. As a result, the nuclear triad is quickly becoming a single component force structure.

Thus, the U.S. is constrained in this scenario to a survivable minimum deterrent nuclear strategy. Moreover, it will remain a minimum deterrent/assured destruction strategy until adequate funding can be achieved for programs aimed at improving its warfighting capabilities. Such programs would include developments in land-based mobile missiles and strategic defenses. These improvements would not only establish a warfighting force structure but enhance the credibility of nuclear deterrence.

F. SUMMARY

The two assumptions about future nuclear strategy that were presented in the introduction to this chapter served to bound the development of the U.S. policy in each scenario. These were that nuclear weapons would continue to exist in the future and deterrence would remain the primary objective of U.S. nuclear strategy. Of all the probable assumptions about future U.S. nuclear strategy, these are perhaps the most realistic. Robert Levine appears to reinforce this assertion when writing about future strategic nuclear policy:

. . . the two fundamental premises for strategic nuclear policy: Nuclear knowledge will not be unlearned, and the weapons will remain unprecedentedly dangerous; . . . Strategic nuclear policy will continue to be based on deterrence.[216]

The increasing proliferation of nations with nuclear weapons that Taylor presents for each scenario also supports these

assumptions. At the same time, while each of the scenarios proposes different future environments, there are other common threads that connect all of them. Among these are, for example, threats that are more economic than military in nature and the increasing multipolarity of the international environment. These and other common links in the areas of threats, constraints, and resources were useful in determining a national nuclear strategy for each of the alternative futures.

Several key components were determined at the outset to have particular relevance to the development any future nuclear strategy. These include: the makeup of the nuclear triad; the status of U.S. extended deterrence; targeting objectives (i.e. countervalue/counterforce); and developments in strategic defenses. These are highlighted in Table 4 below. Similarly, each of these components could be affected by more specific variations in threats, constraints, and resources. For example, the makeup of the triad is affected by defense spending, the closure of local bases, etc.; extended deterrence depends on U.S. military presence overseas (i.e. bases, port facilities, etc.), the international alliance structure, U.S. international political, economic, and military influence, etc.; and so on. Obviously, some factors like defense spending affected all components, yet it was the sum total of all changes that influenced the formulation of a nuclear strategy for each scenario. In addition to these components, however, other factors were also taken into account in the

development of the overall nuclear strategy. Among these were arms control limitations, domestic support for national defense and the U.S. military, and specific threats to U.S. interests (nuclear and otherwise).

Many of the conclusions drawn from this section of the study are similar to those of more notable works in this area[217]. For example, one major conclusion is that the credibility of nuclear deterrence is enhanced by improving the warfighting capabilities of the force structure that supports it. This includes developing a force structure that will provide for damage limitation, escalation control, and war termination should deterrence fail. In addition to developments in strategic defense, mobility, and hardening that were presented here, this also includes improvements in such areas as C³I and warhead accuracy. Yet, this study also proposes some rather radical changes in the nuclear force structure and strategy (e.g. abandoning the triad concept and adopting assured destruction) that appear unfeasible today.

Just as the scenarios may not accurately represent the actual future environment, however, none of the proposed nuclear strategies may be realistic either. More important is the pattern of thought and analysis that characterized this process of determining the "ideal" U.S. nuclear strategy for each alternative future. Specifically, this chapter demonstrates how analyzing the future security environment from the

perspective of threats, constraints, and resources can be useful in the development of future U.S. nuclear strategies.

TABLE 4

SUMMARY OF "IDEAL" U.S. NUCLEAR STRATEGIES

<u>Scenario</u>	<u>Strategy/Targeting</u>	<u>Extended Deterrence</u>	<u>Strategic Defense</u>	<u>Triad</u>
ALPHA	Minimum Deterrence/ Assured Destruction Mostly Countervalue Targeting	Reduced From Loss Of Overseas Bases And Changed Alliance Structure	Buildup In Space- Based Strategic Missile Defense Systems	Shift To Sea-Based Component From Loss Of Bases
BRAVO	Balanced Warfighting Nuclear Deterrence Mixed Counterforce And Countervalue Targeting	More Important Due To Expanded Political And Military Agreements	Little Emphasis Despite Recent Develop- ments In Space Technology	Continued Emphasis And Moderni- zation Of All Three Legs
CHARLIE	Balanced Minimum Deterrence Predominantly Countervalue Targeting	Obsolete Due To Elimination Of Overseas Military Presence	Continued Developments Especially Utilizing The Space Dimension	Shift To Sea-Based Component From Loss Of U.S. Bases And Reduced Defense Spending
DELTA	Survivable Minimum Deterrence Mixed Counterforce And Countervalue Targeting Though More Emphasis On The Latter	Slightly Reduced Due To Reduced USSR Threat To Western Europe	Inadequate Funding Has Delayed All R & D In This Area	Shift To Sea-Based Component Due To Reduced Defense Spending, Loss Of Bases, And A Smaller Force Structure

VII. ANALYSIS AND CONCLUSIONS

A. SUMMARY OF MAJOR ARGUMENTS

This study started out by describing the strategic planning process and, in particular, focused on long-range planning in the military. Within that description, the usefulness of trend analysis in forecasting was discussed as were the common problems associated with long-range military strategic planning. In addition, various methodologies were presented as useful techniques in the process itself. Of these, the alternative futures/scenarios methodology was highlighted as an especially valuable tool to this planning procedure. Moreover, this particular methodology was introduced as the one that was to be employed exclusively in this study.

As the focus of this study is specifically nuclear strategic planning, the next step was to describe the evolution of U.S. nuclear strategy from the end of World War II to the present. Again, this section was not simply intended to be an historical review, but instead an examination of the development of U.S. nuclear strategy as a function of threats, constraints, and resources. Moreover, by describing the formulation of U.S. nuclear strategy from that particular perspective, this chapter attempted to demonstrate the applicability of using similar techniques for future strategy development.

The next section of the study concluded this examination of the evolution of U.S. nuclear strategy by describing the most recent developments from the same perspective. Implicit in this chapter is the realization that research and development programs that support these strategies are intended for the long-term. Therefore, the purpose here was to indicate the direction of U.S. nuclear strategy development for the future. In addition, this section examines the development of the U.S. Navy's Maritime Strategy from the perspective of threats, constraints, and resources. Moreover, the specific focus in this examination is the nuclear portion of the Maritime Strategy. Thus, that part of the chapter attempts to demonstrate the applicability of U.S. nuclear strategy by focusing on one specific armed services' role in that overall national military strategy.

The presentation of Taylor's alternative world scenarios in the following chapter describes four future environments that are used later to postulate future U.S. nuclear strategies. These scenarios are not intended to accurately describe the exact future that will actually exist. Instead, they are four possible future environments based mostly on extrapolating current trends to that time frame. Because Taylor's conclusions and methodology have been critically analyzed and accepted by noted scholars, however, his work was deemed credible enough to represent the alternative future environments for this study.

Finally, the last chapter proposed "ideal" U.S. nuclear strategies for each of the four Taylor scenarios. Since each of the scenarios were presented in the previous chapter from the perspective of threats, constraints, and resources, the planned nuclear strategies were based strictly on the same type of analysis. Thus, the purpose of this study was to demonstrate how the alternative futures methodology could be used to develop probable future security environments for the purpose of long-range military strategic planning. More importantly, this study attempted to demonstrate how future U.S. nuclear strategy could be developed by analyzing one important area--the environment--from the perspective of threats, constraints, and resources.

B. COMPARISON WITH OTHER APPROACHES

Again, the development of any national strategy begins with an articulation of fundamental U.S. values and interests. This is followed by specific objectives that through their achievement are designed to support the national interests. Next, an assessment is made of the external threats to the national interests. Finally, a strategy is formulated by analyzing the above factors and determining the current U.S. strengths and weaknesses (i.e. resources and constraints)[218]. The assumption in this study, however, is that the fundamental U.S. values and interests will be essentially the same in the proposed future environments. As a result, it is the environment itself that determines how U.S.

nuclear strategy will change for each alternative future. Specifically, by analyzing each environment from the perspective of threats, constraints, and resources, nuclear strategies that will best fit each particular future can be postulated.

One of the most notable recent studies on the future security environment was completed by the President's Commission On Integrated Long-Term Strategy[219]. This report seems to confirm Taylor's analysis as well as that of other scholarly works[220] as concerns the predicted structure of the future world setting. Specifically, it appears that the long-range (10-30 years) future environment will be one with external threats to U.S. interests that are more economic than military in nature. As a result, the growing economic countries will become increasingly more important international powers, and, thus potential threats to U.S. interests. This will likely include, for example, the nations of East Asia, especially Japan, China, and South Korea. Moreover, by most accounts, the Soviet threat will be less as the USSR focuses more on internal problems like, for example, economic development. Nevertheless, the Soviet Union maintains a formidable warfighting capacity and continues to drive the size and structure of the U.S. defense budget[221].

Economic improvement for most nations will likely be accompanied by a worldwide rise in nationalism. That in itself and the fact that most nations will remain heavily

armed to protect their interests poses at least a latent threat to the U.S. Moreover, the increasing proliferation of advanced weapons systems and broad transfer of technology significantly raises the number of nations with high-tech munitions. This includes the proliferation of nations with nuclear weapons and delivery systems technology[222]. These latter events in particular reinforce predicted changes in the global distribution of military power away from the current superpowers to a more multi-polar and potentially hostile environment[223]. Moreover, there will likely be a shift away from the current rigid bipolar international alliance structure to one that is characterized by less formal economic and political/military security agreements[224]. That in itself implies changes in the extended deterrence portion of the future U.S. nuclear strategy.

This changing world situation could also have important consequences in the area of constraints for future U.S. nuclear strategies. For example, the worldwide rise in nationalism in parallel with increasing economic and military independence of many nations could result in the loss of overseas bases for the U.S. This virtual elimination of the U.S. military presence overseas would constrain American global interests and require reformulation of national military strategies[225]. Domestically, the loss of heavy industries, for example, challenges the future U.S. capacity for national industrial mobilization. This reduced mobilization base could

become crucial in the event of a protracted conflict in which the U.S. was involved[226]. Again, these constraints not only potentially affect the overall national nuclear strategy but more specifically how U.S. nuclear forces will be deployed and employed in the future.

Other domestic constraints in the U.S. are related to the current economic, demographic, and military-technical trends[227]. For example, an aging U.S. population and one that is increasingly represented by a larger percentage of ethnic minorities will likely be more concerned primarily with social and welfare programs. That and related issues like environmental concerns could influence national leaders to reduce military spending and make defense a lower national priority. In addition, the aging population in combination with such things as the AIDS epidemic and the growing drug problem could constrain the manpower available for military service[228].

In addition to manpower, other future environmental factors in the area of resources could impact long-range U.S. national security (including nuclear) strategies. Mostly, this has to do with technological achievements including those already currently under development or in early use. As concerns nuclear weapons, this could include improvements in warhead accuracy and silo hardening as well as developments in mobility and strategic defenses.

In summary, the future security environment described by this study's alternative future scenarios is very similar to that developed by other recent studies. Therefore, the validity of these scenarios for this study's development of future U.S. nuclear strategies is strengthened. Moreover, these other studies also support the methodological approach of examining and analyzing the environment for developing future U.S. nuclear strategies.

C. AREAS FOR FURTHER RESEARCH

The difficulty in long-range strategic planning is forecasting future patterns of political/military relations. Yet, inability to predict these patterns or deficiencies in the long-term planning process can have adverse impacts on the nation's security. This is especially true "given the considerable lead-times associated with the development and acquisition of contemporary weapon systems." [229] Thus, those nuclear weapons that are chosen for development in any given year will essentially determine at least the long-range force structure and probably the future U.S. nuclear strategy. This makes it even more essential that long-range nuclear strategic planning be able to analyze the future environment with respect to current conditions.

This study has touched on several issues that are important to the development of a national nuclear strategy. Mostly, these were grouped under the categories of threats, constraints, and resources and included such topics as nuclear

targeting, deterrence versus warfighting, and the various strategic nuclear force structure requirements. Other issues like, for example, the utility of tactical nuclear weapons were clearly beyond the scope of this study and therefore were not discussed. Thus, while extended deterrence was mentioned as part of the overall national nuclear strategy, this study restricted its examination to U.S. strategic nuclear issues. Another topic only discussed briefly in this work is strategic defenses and their implications for nuclear strategy. Therefore, these are examples of areas that warrant further research and examination.

There are other areas that proved difficult to this study's development of future U.S. nuclear strategies and, therefore, require further analysis. For example, the strategy's capability to deter small nuclear powers as well as the Soviet Union was not explicitly addressed. Given the projected proliferation of nations with nuclear weapons capabilities, this requirement for future nuclear strategies becomes increasingly important. Another issue particularly difficult to resolve in this study was the difference between nuclear deterrence and warfighting. The question seems to be, are these two concepts at opposite ends of a spectrum or are they complementary? In this author's opinion, as concluded earlier, developing the forces' warfighting capabilities may actually enhance nuclear deterrence. Still, this is an issue

that troubles today's strategists and planners and will likely continue to do the same in the future.

Finally, while separate strategies were proposed for each alternative future scenario, no recommendation was made for an overall U.S. nuclear strategy that would fit all scenarios. It was pointed out, however, that just as any one scenario was not likely to represent the "actual" future environment, the proposed strategies were also unlikely to portray the "ideal" future U.S. nuclear strategy. Nevertheless, it is worth examining a future strategy that will fit a broad range of alternative future environments. That kind of strategy is often referred to as a "hedging strategy." [230]

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